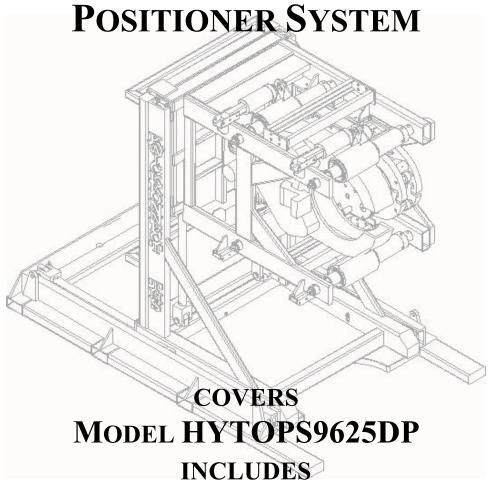


TECHNICAL MANUAL

9 5/8" HYDRAULIC TONG
POSITIONED SYSTEM



TONG MODEL CLE9625DP AND BACKUP MODEL BUCDP9625

WITH DIESEL DRIVEN
HYDRAULIC POWER UNIT

4225 Highway 90, East Broussard, Louisiana 70518 Phone: (337) 837-8847 Fax: (337) 837-8839 www.superior-manf.com



This manual is not a controlled document and is subject to revision without notice. To receive updates and insure you have access to the latest information concerning the 9 5/8" Hydraulic Tong Positioner System, we request you complete this form and return the lower half to SUPERIOR Manufacturing and Hydraulics by mail or facsimile.

Name:						
Company:						
Address:						
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City.		State•				
Postal Codo		Country:				
Telephone.		Fax•				
Tong Model No.:		Serial No.:				
Backup Model No.	•	Serial No.:				
Assembly Date:						
	Technical Manual					
Name:						
Company:		SUFERIOR MIG. & Hyu.				
		USA				
Postal Code:		Telephone: 337-837-8847				
Telephone:	Fax:	Facsimile: 337-837-8839 Web Site: www.superior-manf.com				
Tong Model No.:	Serial No.:					
Backup Model No.:						
Assembly Date:						

TABLE OF CONTENTS

Hazard Warnings					
System Illustrations, Description, Features, & Specifications	2				
reactives, & Specifications	3				
Jaws, Adapters, and Die Information					
Tong Assembly Instructions					
Operational Instructions					
Maintenance Instructions & Trouble Shooting	6				
Spare Parts Recommendations & Parts Lists					
7A Tong	7				
7B Backup	•				
7C Suspension System					
Accessories and Options					
CLE9625DP Tong Illustrations	9				
BUCDP9625 Backup Illustrations	10				
Positioner System Illustrations	11				
Control Panel Illustrations					
Control System Schematic, Parts List, & Descriptions	13				
Load Cell and Torque Gauge	14				
Motor Service Manuals					
Hydraulic Power Unit Illustrations & Parts List	16				
Hydraulic Components Technical Data	17				

9 5/8" Hydraulic Tong Positioner System

On illustration; Specs - Added Controls Weight & Combined Wt. etion to Jaws & Gripping Range Chart. ly Instructions. numbers where to find information for Items 1, 3, & 8. uctions - Corrected Ref. Fig. Item numbers sts ion Brake Band Assy. Corrected illustrations Tong Assy, Upper sy, Idler Gear Assy, Cluster Gear Assy, Pinion Gear Assy, Smart Gear te Shift Assy, Auto Shift Assy, Remote Pivot Pin Assy, Rev. Pin Cyl. Assy, Splined Jaw Assy, & Dovetail Jaw Assy's rations Backup Assy's, Cyl. Assy, & Door Assy's. rations Hytop Assy, Vertical Carriage Assy, Cyl. SWC4-2500-40A, Carriage Assy, Cyl. SWC4-2500-40B, Pivot Cyl. Assy, & Trolley ssy, Rear Spring Assy, Front Spring Assy, Push Cyl. Assy, & Trolley conent Descriptions, Paragraph 1-Added Ref. Item 8; Corrected Reference Figure 6 Schematic & added enlarged illustrations of corrected Schematic Component List. Motor information omponent Technical Data. Lists CLE9625DP, 23, & KITBRG-23 Door Assy. (bell crank shaft changed).
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ations 9 5/8" DP Tong Assy., Dumbell Assy., Remote Shift Assy., ssy., Door Assy. & Brake Band Assy.
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rol Console PU2300 Labels (pg 9) from Table of Contents
58-S Valve Information
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ion Gear Train tions Cluster Gear Assy., Pinion Gear Assy. & Smart Gear Assy.



Memorandum

TO: All owners of **CLINCHER®** Tongs ranging from 5 1/2" UHT thru 20"

FROM: SUPERIOR Manufacturing & Hydraulics, Inc.

RE: Product Bulletin SPB03-03-12 / Installation of Bearing P/N 1905

DATE: March 12, 2003

We suggest that you insert the attached Service Bulletin SPB03-03-12 in the Tong Illustration Section of your manuals (usually Section 9).

9 5/8" Hydraulic Tong Positioner System

HAZARD WARNING

Nomenclature used in this manual:

concerns an operating procedure or practice that, if not WARNING

strictly observed, can result in injury to personnel or loss of

life

Caution concerns an operating procedure or practice that, if not

strictly observed, can result in damage to or destruction of

equipment.

Note concerns an operating procedure or practice that needs

highlighting.

CLINCHER® Tongs and Backups are manufactured to provide a means of making up or breaking out high torque tubular connections. They utilize high pressure hydraulic fluid power which can cause the tong to move suddenly and with great force if the tong is not properly rigged up and operated. CLINCHER® Tongs, Backups and Positioning System contain remotely controlled rotating and reciprocating parts which can severely or fatally injure personnel who are operating, repairing, or near this equipment during its operation. WARNING: Tongs, Backups and Positioners are not to be operated by untrained personnel or personnel with diminished physical or mental capacity. No work of any type, including changing of dies, is to be carried out while the tong and backup are connected to any hydraulic power unit.

CLINCHER® Tongs and Backups are heavy tools. **WARNING:** Users must insure the entire lifting system used to move this equipment including forklifts, cranes, cables, rig mounting points, lift cylinders, slings, winches, pulleys, etc., are capable of handling the static weight of the tong plus any loads which could be transferred to it during handling.

WARNING: Operating the Tong without locking the Backup on the tubular can cause dangerous and unexpected movement of the entire system causing severe equipment damage and causing personnel injury or death. Users must provide a means of safely controlling the tong movements in all directions when it is in use. Failure to account for the its size, weight, movement and the amount of torque developed could result in personnel injury or death.

CLINCHER® Tongs and Backups utilize high pressure hydraulic fluids. Portions of the tong and backup, control valves, hydraulic lines and cylinders may contain high pressure fluid even when the power unit is de-energized and the fluid supply hoses are disconnected. During normal operation the temperature of the hydraulic fluids as well as hoses, piping, valves, etc., can rise to a level which can cause burns. WARNING: Personal protective gear including safety glasses, face shields, protective gloves and protective clothing must be worn to guard against the hazards of high pressure fluids. Tight fitting clothing is required to prevent entanglement in rotating components. These tools should be serviced by thoroughly trained and qualified hydraulic technicians using procedures to safely insure hydraulic pressure is bled from these circuits.

9 5/8" HYDRAULIC TONG POSITIONER SYSTEM

HAZARD WARNING

<u>WARNING</u>: Attempting to operate this unit with a power unit designed for open center valves will result in the power unit operating continuously at maximum pressure, will cause overheating, and may cause equipment failures possibly exposing personnel to high pressure, high temperature hydraulic fluid leaks.

The **CLINCHER®** Tong is equipped with a door interlock system which prevents tong rotation whenever the door is open. This system is to be tested before each mobilization and at every shift change. Should this system be determined to be inoperative, the tong is to be removed from service and tagged as *in-operative* until repairs are made. **CAUTION:** Operating the tong with the door in the open position could result in severe damage to the equipment and will void all manufacturer warranties. **WARNING:** Operating the tong with the door open by means of a defective or bypassed door interlock system exposes the operator and nearby personnel to potentially fatal hazards.

No attempt should be made to operate the **CLINCHER®** Tong and Backup for any purpose other than which it is intended. This system is capable of generating very large clamping forces and torsional loads which, if improperly applied or controlled, could result in damage to the tubular, to the tong or backup, or could possibly result in injury or death of personnel. Do not attempt to operate the unit without correct dies and the proper size tubular being in the tong. See Section 3 for more information concerning the selection and use of dies. **CAUTION: Operating this equipment without the correct size, type and orientation of dies can result in damage to the equipment or tubulars being handled.**

The Positioner can move the Tong in three directions. Front to rear, up or down, and rotate for horizontal or vertical pipe. <u>WARNING</u>: Personnel must remain a minimum 12 foot distance when the unit is being repositioned or operated. An Interlock is provided to insure Tong rotation can occur only when Tong is in maximum elevated position. Bypassing or use of a malfunctioning Interlock to allow rotation at any other position will cause severe structural damage and expose nearby personnel to potentially fatal hazards.

Another Interlock assures vertical movement of the Tong can occur only when the Tong is fully rotated to the vertical or horizontal operating positions. Bypassing or use of a malfunctioning Interlock to allow vertical Tong movement when the Tong is at any position other than the full vertical or horizontal position will cause severe structural damage and exposes nearby personnel to potentially fatal hazards. These Interlocks are to be tested at the beginning of every shift change. Should this system be determined to be inoperative, the tong is to be removed from service and tagged as *in-operative* until repairs are made.



GENERAL INFORMATION

HYDRAULIC PRODUCT SAFETY

HYDRAULIC PRODUCT SAFETY



WARNING: Valve lever (spool) may "stick" (not center) under certain conditions allowing the hydraulic equipment to continue to operate and could cause serious injury, death or equipment failure.

VALVE SAFETY: Read and follow instructions carefully. Failure to observe instructions and guidelines may cause serious injury, death or equipment failure. A sticking valve (spool bind) may be caused by one or more of the following factors:

<u>DIRTY OIL</u>: Oil must be filtered to a minimum of 25 microns. Filters should be changed regularly - spin-on types after 50 hours of initial use and then after every two hundred fifty hours of use. Use of a condition indicator is recommended. Consult your tractor or implement owner's manual for filtration and changing recommendations for internal systems.

<u>OIL REQUIREMENTS</u>: Premium quality anti-wear type oil with a viscosity between 100 and 200 SSU at operating temperatures. Certain synthetic oils may cause spool seals to swell and the valve to stick. If in doubt, call CROSS Engineering.

IMPROPER HOOK UP OR MOUNTING: Always use the proper size fittings. Hook up "in" & "out" as noted on the valve body. Do not overtorque pipe fittings. Mounting surfaces should be flat and care should be used when tightening mounting bolts. Over-tightened bolts can cause spool bind and casting breakage. When hooking a valve in series, always use a power beyond sleeve. Consult your tractor or implement manual to make sure you have the proper quick disconnect line connected to the inlet of the remote valve.

<u>MISAPPLICATION</u>: Always use the proper valve for the job. CONVERTA, CD, CS or CA valves should <u>never</u> be used for metered heavy load lifting - loaders or similar applications. Use an open center valve for open center applications and a closed center valve for closed applications. If in doubt, check with your tractor dealer. Contact CROSS if the valve allows the hydraulic equipment to creep excessively.

<u>MAINTENANCE</u>: Make sure all bolts are tightened and torqued to the recommended specification. Bent or broken parts should not be used. Replace immediately. Always use exact replacements. Always protect valve spool from paint overspray.

Faulty quick disconnects can cause high back pressures and sticking spools. Check quick disconnects periodically to make sure they are functioning properly. If valve spool does not center or appears to stick, do not use!

PUMPS & MOTORS SAFETY:



A relief or bypass in your hydraulic system is necessary to prevent pump from breakage due to overpressurization. Use correct fittings and proper oil as noted in the technical service manual packed with each unit. Change oil as recommended by your implement or tractor manufacturer.

CYLINDER SAFETY:



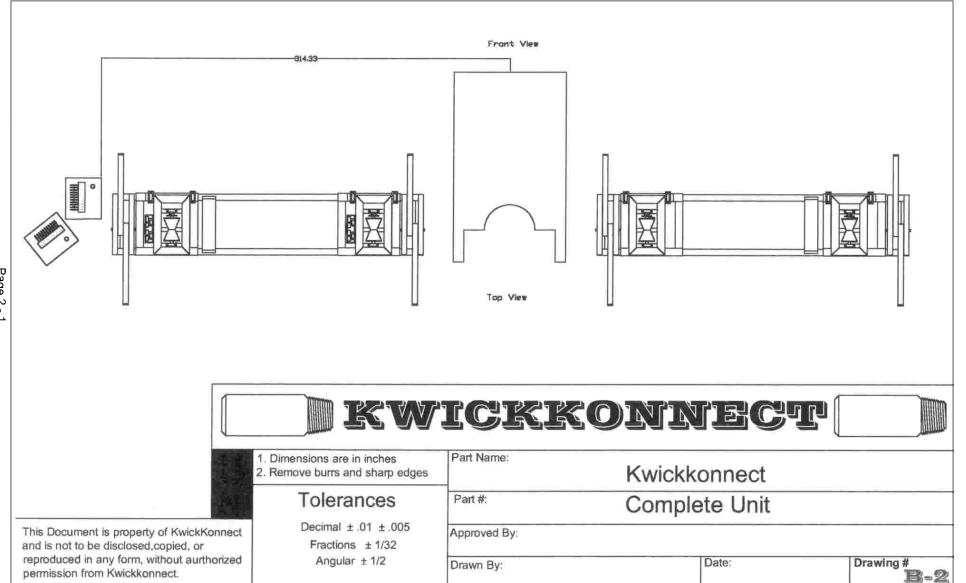
Check clevis clearances before, during and after extending the cylinder and before using the cylinder under pressure to avoid possible injury, or bent or broken rods caused by binding. Never operate a cylinder above recommended pressures. Never use a cylinder as a safety device when transporting equipment.

PINHOLE LEAKS:

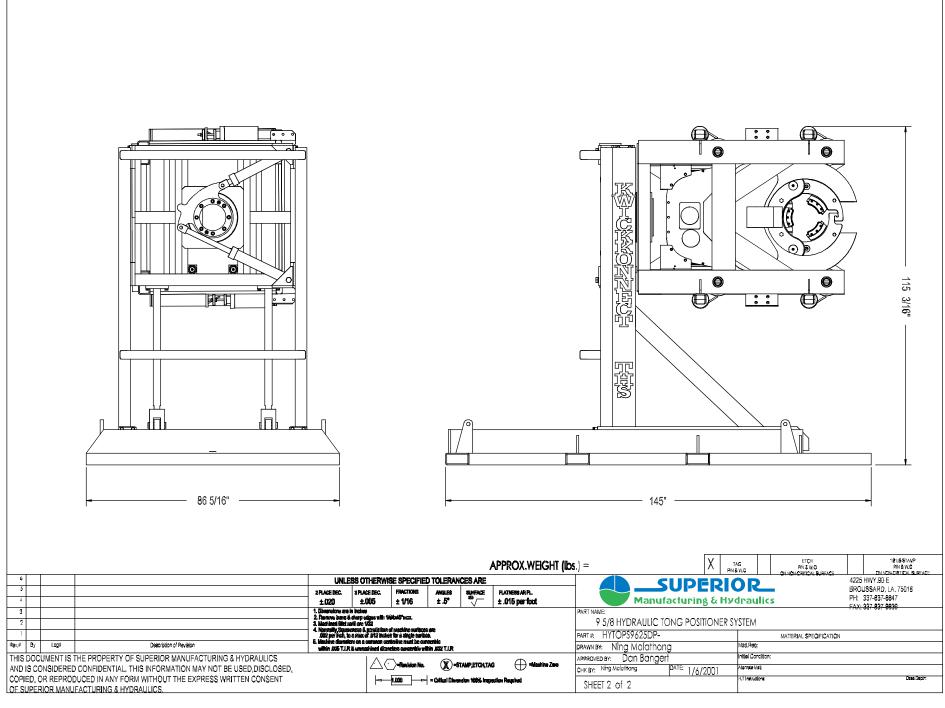


If you observe a pinhole leak, discontinue use of the component. If oil has penetrated your skin or contacted your eye, seek medical attention immediately!









GENERAL DESCRIPTION and APPLICATION

The **CLINCHER®** products described in this manual are used in connection with Kwick Konnect's Pipe Rack System to allow "Hands Off" stabbing, make-up or break-out of casing, tubing, or drill pipe in horizontal or vertical positions. Products covered in this manual include:

- 1. CLE9625DP CLINCHER® 9 5/8" Remotely Operated Drill Pipe Tong
- 2. BUCDP9625 **CLINCHER®** 9 5/8" Remotely Operated **LOCKJAW™** Backup for Drill Pipe
- 3. HYTOPS9625DP **CLINCHER®** Tong Positioning System
- 4. Instrument and Control Systems for Tong, Backup, Positioner & Pipe Rack
- 5. Diesel Driven Skid Mounted Hydraulic Power Unit

The CLE9625DP Tong is a remotely operated high torque hydraulic tong capable of handling tubulars ranging from 4 3/4" to 9 5/8" in diameter. It is provided with Hydraulically Operated Tong Door Actuator, Hi/Lo Gear Shifter, Motor Speed and Make/Break Backing Pin Controls. Additionally, a Cage Plate Position Sensor and Control System simplify remote operation by automatically stopping reverse rotation of the Cage Plate in the open throat position.

The BUCDP9625 **LOCKJAW**TM Backup is a remotely operated high torque hydraulic backup which fully encircles the tubulars to compliment the tong during make-up and break-out operations. Its patented **LOCKJAW**TM geometry provides maximum structural strength in the smallest possible package with minimal moving parts. It features a door position sensor to limit the amount of clamping force developed if inadvertently used on oversized tubulars which prevent full door closing/locking.

The HYTOPS9625DP Positioning System is a self contained structure with actuators which can move the tong in three axis. This system can be used on the rig floor to make/break tubulars while RIH or POH. It can be used off-line for building/breaking down BHA or strands of tubulars. Installation requires coupling supply, return and control circuit hydraulic hoses. Removal is as quick and easy as installation. Additionally, the Positioning System functions as a shipping skid for the tong and backup.

The instrument and control system is mounted in two portable stainless steel enclosures. The control system is detached from the positioning system and is latched into a storage frame in the power unit when not in use. When operating, the control system is relocated near the positioner and pipe racks.

DESCRIPTION and APPLICATION

The **CLINCHER®** Tong system is an Aopen-throat@ design which can handle tubulars as small as 4 3/4 inches to as large as 9 5/8 inches in diameter. The Backup can accommodate tubulars as large as 9 5/8 inches. This system features two (2) jaws in the tong and three (3) in the backup which encircle the pipe. Wrap-Around jaws and dies, combined with our low friction jaw technology and constant radial load cam system provide exceptional gripping capabilities with reduced pipe deformation, stress, and marking. Using our non-marking aluminum die system or **GRIT FACE**TM dies in the Tong and Backup will now allow stainless steel corrosion resistant alloys (CRA) to be run as quickly and easily as a traditional tong runs conventional steel tubulars.

Notable Features and Benefits

Low Friction Jaws increases cam angle efficiency to allow use of aluminum dies

Splined Die System aligns the die with the tubular and more evenly distributes radial load,

essentially wrapping the die around the tube reduces pipe stress,

deformation, and minimizes marking

Constant Cam Angle insures an adequate radial load is available regardless of relative rotation

to enhance performance on undersized pipe

Die Retention Method provides an enhanced method of preventing equipment damage and die

loss if the pipe is inadvertently moved while the tong is still gripping the

pipe

In addition to these unique features listed above, the **CLINCHER®** Tong and Backup System is also equipped with numerous standard features including:

Door Interlock prevents tong ring gear rotation whenever the tong door is open but

allows control and operation of the Backup and lift cylinder at all times

Encoder Adapter accepts customer's turns encoder to signal to a torque/turn computer

Pressure Control Valve adjustable pressure control valves allow the customer to limit the amount

of pressure applied and torque developed

The features described above are covered by US and foreign patents or pending US and foreign patents.

DESCRIPTION and APPLICATION

Tong Application

After completing the makeup or breakout cycle the jaws are opened by reversing the tong motor to drive the ring gear and cam surfaces in the opposite direction until the reversing pin contacts the ring gear shoulder. Springs are used to return the jaws to their fully open position. A position sensor automatically interrupts power to the ring gear and cage plate when they are returned to the normal open throat position.

The cage plate assembly and jaws are rotationally restrained by the cage plate brake system. Relative rotation between the ring gear and the cage plate assembly forces the front jaws to lock or unlock and the rear jaw to advance or retract.

During a jaw closing cycle, the jaws advance until they contact the pipe. After completing the makeup or breakout cycle, the jaws are opened by reversing the tong motor to drive the ring gear and cam surfaces in the opposite direction until the reversing pin contacts the ring gear shoulder. Springs are used to return the jaws to their fully open position.

Backup Application

The **CLINCHER®** Backup has an Aopen throat@ design with three jaws that encircle the pipe. The front jaws are operated by cam surfaces on the rear jaw cylinder. During a jaw closing cycle, the front jaws swing in and interlock as the rear die approaches the pipe. Once locked on the pipe, pressure is locked in the backup cylinder by a load holding valve. When opening the backup jaws, the cylinder operation is reversed to retract the rear die and unlock the jaws. Springs move the front jaws to their fully open position.

SPECIFICATIONS TONG, BACKUP, & SUSPENSION SYSTEM

Power Supply Requirements: 2,500 PSI, 50 GPM Pressure Compensated for Closed Control Valve.	
Maximum Torque	120,000 ft. lbs. / 162,896 Nm
Maximum Operating Pressure	2,500 psi / 172 Bar
Maximum Allowable Flow Rate	60 GPM / 226 LPM
RPM @ 50 GPM / 189 LPM: Manual Gearbox with 2-Speed Hydraulic Motor High Gear / High Speed High Gear / Low Speed Low Gear / High Speed Low Gear / Low Speed	44 RPM 5,000 ft/lbs 6,779 NM 22 RPM 10,000 ft/lbs 13,558 NM 4 RPM 60,000 ft/lbs 81,348 NM 2 RPM 120,000 ft/lbs 162,696 NM
Handle Length / Tong (When Installed in Suspension System)	44.63" / 113.4 cm
Positioner Overall Height	66.0" / 167.6 cm
Positioner Overall Length / Tong & Backup	66.6" / 169.2 cm
Positioner Overall Width / Tong & Backup	39.3" / 99.8 cm
Weight / Tong Weight / Backup Weight / Suspension System Weight / Controls Combined Weight Tong, Backup, & Positioner System	4500 lbs. / 2041.2 kg 2700 lbs. / 1224.7 kg 10300 lbs. / 4672.0 kg 2000 lbs. / 907.2 kg 19500 lbs. / 8845.1 kg
Jaw Capacity / Tong & Backup	4 3/4" thru 9 5/8"
Gripping Range Dovetail Jaws & Adaptors Only	1/2" under nominal size
Positioner Travel – Horizontal Positioner Travel - Vertical	40" / 101.6 cm 40" / 101.6 cm

Operates using Dovetail Strip Dies, Steel Tooth Wrap Around Dies, **GRIT FACETM** Wrap Around Dies, and Aluminum Wrap Around Dies.

Standard Equipment:

- Door Interlock

- Two Speed Hydraulic Motor

Optional Equipment:

- Electronic Solenoid Dump Valve
- Hydraulic Intensifier for Backup
- Varying Outlets for Torque Turns Computer Sending Units

SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System

INTRODUCTION TO JAWS AND DIE ADAPTERS FOR 9 5/8" DRILLPIPE TONG AND BACKUP

This tong system can be used with tubing, casing and drillpipe. When dealing with high torque drillpipe connections, we grip the pipe with dovetail strip dies. These dies cannot be directly installed in the tong and backup so you will need tong jaws (a set of 2 pieces) and three (3) dovetail die adapters for the backup. Each of these parts will hold two dovetail strip dies in a "v-block" arrangement. Tong jaws and backup dovetail die adapters are designed to be compatible with a specific tool joint diameter when the standard insert thickness is used. We normally design our jaws and adapters to use 1/2" thick dovetail die inserts. The design of our tong and backup allows the jaws and adapters to travel or close up to accommodate pipe which is as much as 1/2" smaller than nominal dimensions. Thicker dovetail die inserts can be installed in the jaw and adapter to accommodate even smaller pipe. While very thick die inserts are available, we do not generally recommend using dies which are thicker than 13/16" as they can damage the dovetail grooves when subjected to high torques. You can also get slightly thinner inserts to allow the jaws and adapters to be used on oversized pipe.

When making up tubing and casing, most operators prefer to use tong and backup die systems which do not leave significant marks on these tubulars. Marks caused by slip and tong die inserts are considered to be damaged and are known to cause premature failures. See the attached **CLINCHER®** Tong Die Tech Update which contains more details. To prevent such problems, we offer three other types of tong and backup die systems. They are our fine toothed steel dies, **GRIT FACE**TM Dies and smooth aluminum dies. The back side of each of these dies features a spline system which locks the die in place with a mating spline in the tong jaw or backup. These splined jaws and splined die adapters are not compatible with the drillpipe jaws and die adapters which use dovetail dies.

We have designed four different sizes of tong jaws. The drillpipe jaws and backup die adapters utilizing dovetail die inserts are for drillpipe or drill collars with tool joint diameters of 9.5/8" and 7.1/4". We have designed two different splined tong jaws for tubing and casing. One is for 8.5/8" to 5.1/2" tubulars and the other for 5.1/2" and smaller tubulars. Presently we have both of these splined jaws in production as well as the 7.1/4" drillpipe tong jaws and dovetail die adapters.

Attached is a chart which lists dimensional data for many common drillpipe connections. This chart also contains suggested nominal tong jaw sizes, adapter sizes and dovetail die insert thicknesses. For drillpipe tong jaws and adapters, let us know as quickly as possible the diameters of your drillpipe tool joints to be run. If you have any questions or comments, please contact Superior Manufacturing & Hydraulics.

SUDEDIOD Manufacturing & Hydraulica Inc.	
SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System Revision: 09/01	Page 3 - 2

(Gripping ra	nge, jaws,	, adapte	ers and	dovetail die	e inserts	for CLINC	HER® 9	5/8 Drillp	ipe Tong	and 9 5/	8 Lockjaw	Backup f	or Drillpipe
Nominal Dovetail Tong Jaw and Dovetail Die Adapter Size	Tong Jaw Assembly Part Number	dovetail tong jaw part number	tong jaw roller part number	tong jaw pin part number	backup dovetail die adapter part number	nominal dovetail jaw & adapter size				•	•	g range (OD in i with thickness o	,	
Adapter Size	assembly consists of two jaws c/w pins, rollers, dovetail dies and die	two pcs reqd per set	two pcs reqd per set	two pcs reqd per set	3 dovetail die adapters required to dress backup	Size	0.8125 undersized (use this size for emergencies only)	0.75 undersized	0.6875 undersized	0.625 undersized	0.5625 undersized	0.5 STANDARD	0.4375 oversized (use this size for emergencies only)	
9 5/8 x 6 3/8	retainers CJDT9663	82120	82067	82066	BUDT96256375	6 275	5.750	5.875	6.000	6.125	6.250	6.375	6.500	maximum nina OD for dia 8 iau
9 5/6 X 6 5/6	CJD19663	02120	02007	02000	BUD 190200375	6.375	5.750	5.375	5.500	5.625	5.750	5.875	6.000	maximum pipe OD for die & jaw minimum undersized condition
9 5/8 x 6 5/8	CJDT96xx	xxxxx	82067	82066	BUDT96-6625	6.625	6.000	6.125	6.250	6.375	6.500	6.625	6.750	maximum pipe OD for die & jaw
							5.500	5.625	5.750	5.875	6.000	6.125	6.250	minimum undersized condition
9 5/8 x 7 1/4	CJDT9672	82081	82067	82066	BUDT96-7250	7.250	6.625	6.750	6.875	7.000	7.125	7.250	7.375	maximum pipe OD for die & jaw
9 5/6 X / 1/4	CJD19072	02001	02007	02000	B0D190-7230	7.230	6.125	6.250	6.375	6.500	6.625	6.750	6.875	minimum undersized condition
							0.720	0.200	0.070	0.000	0.020	0.700	0.070	minimum undersized condition
9 5/8 x 7 1/2	CJDT9675	82094	82067	82066	BUDT96-7500	7.500	6.875	7.000	7.125	7.250	7.375	7.500	7.625	maximum pipe OD for die & jaw
							6.375	6.500	6.625	6.750	6.875	7.000	7.125	minimum undersized condition
9 5/8 x 8.000	CJDT9680	82093	82067	82066	BUDT96-8000	8.000	7.375	7.500	7.625	7.750	7.875	8.000	8.125	maximum pipe OD for die & jaw
0 0/0 X 0.000	00210000	02000	OLOGI	02000	202100 0000	0.000	6.875	7.000	7.125	7.250	7.375	7.500	7.625	minimum undersized condition
9 5/8 x 8.125	CJDT96xx	xxxxx	82067	82066	BUDT96-xxxxx	8.125	7.500	7.625	7.750	7.875	8.000	8.125	8.250	maximum pipe OD for die & jaw
							7.000	7.125	7.250	7.375	7.500	7.625	7.750	minimum undersized condition
9 5/8 x 8 1/2	CJDT9685	82092	82067	82066	BUDT96-8500	8.500	7.875	8.000	8.125	8.250	8.375	8.500	8.625	maximum pipe OD for die & jaw
0 0/0 X 0 1/2	00010000	02002	02001	02000	B0B100 0000	0.000	7.375	7.500	7.625	7.750	7.875	8.000	8.125	minimum undersized condition
9 5/8 x 9 1/8	CJDT9691	82091	82067	82066	BUDT96-9125	9.125	8.500	8.625	8.750	8.875	9.000	9.125	9.250	maximum pipe OD for die & jaw
							8.000	8.125	8.250	8.375	8.500	8.625	8.750	minimum undersized condition
9 5/8 x 9 5/8	CJDT9696	82068	82067	82066	BUDT96259625	9.625	9.000	9.125	9.250	9.375	9.500	9.625	9.750	maximum pipe OD for die & jaw
9 3/6 X 9 3/6	C3D19090	02000	02007	62000	BOD 190239023	9.025	8.500	8.625	8.750	8.875	9.000	9.125	9.750	minimum undersized condition
							0.000	0.020	0.700	0.070	3.000	3.720	3.200	minimum andersized condition
Note: XXXXX indi	cates this size ha	s not been des	signed at th	is time, bu	t is available upor	request.								
for 1 1/4" wide x 3	3 7/8" long straigh er jaw or 8 pcs re	nt toothed dove quired per jaw	etail die inse set and do	erts used ir vetail die a	dapters (4 pcs	pcs required	DTI1661	DTI1651	DTI1642	DTI1632	DTI1622	DTI1601	DTI1612	
for 1 1/4" wid	e x 3 7/8" long dia	amond toothed	dovetail di	e inserts u	S - CLINCHER ® _l sed in dovetail jav die adapters (4 po	vs (4 pcs	upon request	upon request	upon request	DTI1632D	DTI1622D	DTI1601D	upon request	

			Bac	ckup for [Orillpipe 1	for use on t	ubing and casing	3		
Nominal wraparound	Splined Jaw	splined jaw	splined jaw	splined jaw	clip part	backup splined	clip part number for	available wraparound	die series (two d	ies are required to
tong jaw and	Assembly	part number	roller part	pin part	number for	die adapter part	backup splined die	dress tong jaws and		
wraparound adapter size	Number		number	number	tong jaws	number	adapter	backup for a total of dies rec	five dies per too juired for couplin	
	assembly consists of two jaws c/w pins, rollers, clips and clip bolts	two pcs reqd per set	two pcs reqd per set	two pcs reqd per set	eight pcs reqd per set	3 splined die adapters required to dress backup	(Y/Z indicates "Y" clips reqd to dress splined die adapter and "Z" pcs reqd to dress three adapters required in backup)	fine tooth steel dies	GRIT FACE™ dies	non-marking aluminum dies
9 5/8 x 8 5/8 - 5 1/2	CJ-9686	82050	82067	82066	82070	BUA96DP-08625	BUCDP9697 (2/6)	BUC8625-nnnnn	BB8625-nnnnn	not recommende
9 5/8 x 5 1/2 - 2.062	CJ-LF9655	82069	82071	82082	BUC5520	BUA96DP-05500	73064 (8/24)	BUC5500-nnnnn	BB5700-nnnnn	BUCA5500-nnnn

Note: CLINCHER wraparound die are machined to specific casing, tubing, coupling or accessory diameter. Additional dies must be orderd to match specific coupling diameters associated with accessories or special clearance premium tubular connections.

CLINCHER® WRAP AROUND DIES

CLINCHER® Wrap Around Dies are available in three types:

Fine Toothed Steel Dies: for low to ultra high torque applications on carbon steel

tubulars including tubing, casing, and drill pipe

Smooth Faced Aluminum Dies: for low to moderate torque applications on fiberglass and

corrosion resistant alloy (stainless steel) tubulars

GRIT FACETM Dies: for low to high torque applications on fiberglass and

corrosion resistant alloy (stainless steel) tubulars where the use of steel dies is prohibited as well as on carbon

steel tubulars where reduced marking is desired

CLINCHER® Dies are designed to match the OD of the tubing, casing, coupling, or accessory being made up or broken out. Each die is stamped on the top or side to identify its size. Using Fine Toothed Steel Dies which are slightly larger than the tubular is acceptable provided the difference in diameters is less than 3/32" (0.093"). Aluminum and **GRIT FACE**TM Dies should be matched with the specific tubular diameters required. **Note:** The use of improperly sized dies can result in reduced torque capacity, increased pipe marking, and reduced die life.

CAUTION: Do not attempt to grip tubular diameters which are larger than the dies being used. Failure to observe this precaution can result in damage to the tubular or tong jaws.

In emergencies where correct die sizes are unavailable, some operators have successfully used two different sizes of dies to accommodate unusual, nonstandard diameters.

CLINCHER® Wrap Around Dies are manufactured in specific diameters to match standard tubing and casing diameters, API coupling diameters, selected work string connection diameters and certain commonly used premium connection coupling diameters. **CLINCHER®** Wrap Around Dies should not be used on tubulars which are larger than the nominal die size. Steel Toothed Dies can be used on tubulars which are no smaller than 3/32" (0.093") less than the nominal die size. Aluminum and **GRIT FACE**TM Dies should be matched with the specific tubular diameters required.

Note: Fine Toothed Steel Dies are normally stocked in our Broussard, Louisiana facility. Aluminum and **GRIT FACE**TM Dies are normally made to order although a limited range of sizes and small quantities may be available from stock. Contact SUPERIOR Manufacturing & Hydraulics for information concerning availability of stock and special die sizes.

SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System Revision: 07/01	Page 3 - 6	

FASTENER LUBRICATION AND MAKE UP TORQUE REQUIREMENTS

Most bolts, nuts, and other threaded components are to be lubricated with Never-Seez or equivalent before assembly. Certain fasteners are to be assembled using permanent or removable Loctite as indicated in the assembly instructions. All tapered pipe threads are to be treated with a Teflon based pipe dope to assist in makeup and prevent leakage.

CAUTION: Do not use teflon tape. Improper application of teflon tape can cause joint failures. Teflon tape can release large particles which can plug small passages in hydraulic equipment.

All standard fasteners used in **CLINCHER®** products are to be GRADE 8 or better. DO NOT SUBSTITUTE lesser grades of fasteners. All fasteners are to be made up to the torque charted below. Failure to properly assemble these fasteners can result in their loss, product malfunction, and ultimately result in situations where personnel can be exposed to dangerous situations.

TONG FASTENERS					
Size	Application	Torque			
1/4 - 20 NC	door switch mounting bolts, cage plate stop switch, backup pivot pin	10 ft lbs			
3/8 - 16 NC	bearing caps, upper housing, pivot pin, auto shift cyl. bracket, remote switch bracket, door guard, backup clip bolts	33 ft lbs			
1/2 - 13 NC	clip bolts, jaw bolts, motor housing, pivot pin center bolt, cage plate swt. housing	93 ft lbs			
5/8 - 11 NC	top and bottom tong plates, bearing caps, smart gear splined plates, motor shaft bearing mount	180 ft lbs			
3/4 - 10 NC	top and bottom backup plates, backup cyl. guide and door wedges	317 ft lbs			
3/4 - 16 NF	auto shift cyl.	1			
7/8 - 9 NC	door bell crank shaft	1			
7/8 - 14 NF	cam follower	512 ft lbs			
1 - 8 NC	backup cyl., backup door	715 ft lbs			
1 1/8 - 12 NF	backup cam follower	233 ft lbs			
1 1/2 - 12 NF	dumbbell roller, idler shaft	1,200 ft lbs			

No torque applied, tighten until snug.

LUBRICATION STANDARDS

Bearings and gears must be lubricated to minimize friction, cool, exclude foreign matter, and prevent corrosion. **CLINCHER®** recommends using Texaco Marfak MP 2 or equivalent for all grease zerts, roller bearings, and bushings. Gears located within the clutch housing or between the tong plates are to be heavily lubricated using PLUSCO 855 or equivalent.

This section pertains to the physical assembly of the **CLINCHER®** CLE9625DP Drill Pipe Tong. Section 9 illustrates the individual sub assemblies in more detail. The purpose of this section is to guide the technician in the order of assembly as we would accomplish in the manufacturing process at our plant. Use this section as a guide to help you familiarize yourself with the component parts of the CLE9625DP. We have included drawings on the following pages to aid in the assembly. The drawings are laid out in the order in which you would assemble/disassemble the unit.

Order of Assembly:

- 1. Locate suitable working height. Approximately 6" above your waist. Tong Assembly Stands are available from Superior Manufacturing & Hydraulics, Inc. which are custom made for tong service work.
- 2. Install Bottom Tong Plate Assembly PN 82002, on Assembly Stand.
- 3. Bolt CLE9625DP Tong Mid Body Assembly PN 82003 to Bottom Tong Plate PN 82002, with (21) 5/8"-11 x 2" HHCS PN 1160, (21) 5/8" Lockwasher PN 1151, and (2) 5/8"-11 x 1" SHCS PN 1153.
- 4. Press Bearing PN 1905 into Third Stage Pinion Bottom Bearing Cap PN 82021.
- 5. Install Third Stage Pinion Bottom Bearing Cap Assembly onto Bottom Tong Plate Assembly PN 82002 using (4) 5/8"-11 x 1 1/2" SHCS PN 257 (use removable Loctite), (2) 3/8"-16 x 1/2" Set Screws PN 1029 (use removable Loctite), and 1/8" Flush Plug.
- 6. Press Bearing PN 1905 into Pinion Bottom Bearing Cap PN 82021.
- 7. Install Pinion Bottom Bearing Cap Assembly onto Bottom Tong Plate Assembly PN 82002 using (4) 5/8"-11 x 1 1/2" SHCS PN 257 (use removable Loctite), (2) 3/8"-16 x 1/2" Set Screws PN 1029 (use removable Loctite), and 1/8" Flush Plug.
- 8. Press Bearing PN 1917 into Cluster Gear Bottom Bearing Cap PN 82016.
- 9. Install Cluster Gear Bottom Bearing Cap Assembly onto Bottom Tong Plate Assembly PN 82002 using (3) 5/8"-11 x 2" HHCS PN 1160 with (3) 5/8" Lockwashers, (2) 3/8"-16 x 1/2" Set Screws PN 1029 (use removable Loctite), and 1/8" Flush Plug.
- 10. Dumbell Roller Assembly: (12 Units Required, Including three for Door Assembly)
 - a) Install 1/8" NPT Zert PN 1001 on each end of Dumbell Roller Shaft PN 82028.
 - b) Install 1 1/2"-12 Jam Nut PN 1292 onto Dumbell Roller Shaft PN 82028.
 - c) Press (1) Garlock Bushing PN 30DU36 into end of Dumbell Roller PN 82030.
 - d) Press (1) Garlock Bushing PN 30DU36 into opposite end of Dumbell Roller PN 82030.
 - e) Install (3) Inner Race PN 1918, (1) Inner Race PN 82030A, and (2) Inner Race PN 1918 into Dumbell Roller Assembly.
 - f) Install Garlock Thrust Spacer PN 82033 and Thrust Spacer PN 82029, one on each end of Dumbell Roller Assembly.

- g) Install Dumbell Shaft Assembly into Dumbell Roller Assembly from the bottom end (the end that has (3) Inner Race PN 1918 together).
- h) Install 1 1/2"-12 Jam Nut PN 1292 on other end of each Dumbell Shaft PN 82028.
- 11. Idler Gear Assembly: (4 Units Required)
 - a) Press Bearing PN 1905 into one end of Idler Gear PN 82036 and install Internal Snap Ring PN 1926.
 - b) Press Idler Gear Assembly onto Idler Shaft PN 82038.
 - c) Install Bearing PN 1905 onto Idler Shaft, press into other end of Idler Gear, and install Internal Snap Ring PN 1926.
 - d) Install Idler Race PN 82037 on one end of Idler Gear and Shaft Assembly using (6) 1/2"-13 x 1 1/2" SHCS PN 248 (use removable Loctite).
 - e) Install Idler Spacer PN 82063 on end of Idler Gear and Shaft Assembly.
 - f) Bolt Idler Shaft PN 82038 to Bottom Tong Plate PN 82002 with 1 1/2"-12 Low Profile Nylock Jam Nut PN 1273.
- 12. Install Ring Gear PN 82006 into Tong Body making sure teeth in Idler Gears PN 82036 align with teeth in Ring Gear.
- 13. Install (12) Dumbell Roller Assemblies around Ring Gear PN 82006 making sure holes in Dumbell Roller Assemblies match up to holes in Bottom Tong Plate Assembly PN 82002. Hint: Temporarily install Dumbell Roller Shafts thru Dumbell Roller Assembly and Bottom Tong Plate to control position.
- 14. Install Third Stage Pinion PN 82011 into Bearing PN 1905 which was previously installed into Bottom Bearing Cap PN 82021 (for Smart Gear Assembly).
- Install Idler Race PN 82037 on other end of Idler Gear and Shaft Assembly using (6) 1/2"-13 x 1 1/2" SHCS PN 248 (use removable Loctite). Install Idler Spacer PN 82063 on end of Idler Shaft Assembly.
- 16. Install Low Pinion Gear PN 82022 into Bearing PN 1905 which was previously installed into Pinion Bottom Bearing Cap PN 82021. Install High Gear PN 82023 onto Low Pinion Gear.
- 17. Cluster Gear Assembly:
 - a) Install Bottom Cluster Spacer PN 82017 and Low Drive Gear PN 82035 onto Cluster Shaft PN 82014.
 - b) Install Cluster Shaft into Bearing PN 1917, which was previously installed into Bottom Cluster Bearing Cap PN 82016.
 - c) Install Mid Cluster Spacer PN 82018 and Low Gear PN 82026 onto Cluster Shaft.
 - d) Press Bearing PN 1905 into Top Tong Plate PN 82001.

- 18. High Gear Idler Assembly:
 - a) Press Bearing PN 1982 into High Gear Idler PN 82100.
 - b) Install Internal Snap Ring PN 1948 into High Gear Idler PN 82100.
 - c) Install High Gear Idler Assembly onto High Gear Idler Shaft welded onto Motor Shaft Bearing Mount PN 82073.
 - d) Install External Snap Ring PN 1921 onto High Gear Idler Shaft.
- 19. Press Bearing PN 1901 into Motor Shaft Bearing Mount PN 82073 for Motor Shaft PN 82040, then install Internal Snap Ring PN 1948 into groove of Motor Shaft Bearing Mount.
- 20. Install Motor Shaft Bearing Mount Assembly onto Bottom Tong Plate PN82002 using (2) 5/8" x 1 1/2" Dowel Pins PN 1228 and (2) 5/8"-11 x 2" HHCS with (2) 5/8" Lockwashers PN 1151.
- 21. Install Top Tong Plate Assembly PN 82001 onto Mid Body Assembly PN 82003 using (16) 5/8"-11 x 2" HHCS PN 1160 with (16) 5/8" Lockwashers PN 1151, (2) 5/8"-11 x 2" SHCS PN 1155, (2) 5/8" Hi Collar Lockwashers PN 1152, and (2) 5/8"-11 x 1" SHCS PN 1153.
- 22. Insert Dumbell Roller Shafts through Top Tong Plate Assembly PN 82001 and fasten with 1 1/2"-12 Jam Nut PN 1292.
 - **WARNING:** Insert Thrust Spacers and correctly position.
- 23. Bolt Idler Shaft PN 82038 on Top Tong Plate using 1 1/2"-12 LP Nylock Jam Nut PN 1273.
- 24. Cluster Gear Assembly:
 - a) Install Second Stage Pinion PN 82020 and Top Pinion Spacer PN 82097onto Cluster Shaft PN 82014.
 - b) Press Bearing PN 1917 into Top Cluster Bearing Cap PN 82015.
 - c) Install 1/8" 90° Zert PN 1002 and (2) 3/8"-16 x 1/2" Set Screws PN 1029 (use removable Loctite) into Top Cluster Bearing Cap Assembly.
 - d) Install Top Cluster Bearing Cap Assembly onto Upper Housing Cover PN 82024 using (3) 5/8"-11 x 2" HHCS PN 1160 with (3) 5/8" Lockwashers PN 1151.
- 25. Turns Counter Bearing Cap Assembly:
 - a) Press Bearing PN 1903 into Turns Counter Bearing Cap PN 82025.
 - b) Install (2) 3/8"-16 x 1/2" Set Screws PN 1029 (use removable Loctite). Do not overtighten. Back off 1/8 turn after contacting Bearing.
 - c) Press Bearing Cap Assembly onto Low Pinion Gear PN 82022 and install onto Top Tong Plate using (3) 5/8"-11 x 1 1/2" HHCS PN 1157 with (3) 5/8" Lockwashers PN 1151.

- 26. Smart Gear Assembly: (2 Units Required)
 - a) Fit Ring Gear PN 82007A onto Bottom Splined Plate PN 82007C.
 - b) Slide (8) Bellville Springs PN 82010 onto Bellville Shaft PN 82007D (10 Spring Assemblies required).
 - c) Install (10) Spring Assemblies into Ring Gear Assembly, placing 4 Springs on each side of spline and Shaft resting in groove.
 - d) Fit Top Splined Plate PN 82007B onto Ring Gear and Spring Assembly. Bolt together using (5) 5/8"-11 x 1 3/4" SHCS PN 1154 (use removable Loctite).
 - e) Press Bearing PN 1905 and Lower Smart Gear Spacer PN 82096 into Top Tong Plate, onto Third Stage Pinion PN 82011.
 - f) Install Smart Gear Assembly PN 82007 and Top Smart Gear Spacer PN 82019 onto Third Stage Pinion.
 - g) Press Bearing PN 1917 into Top Bearing Cap PN 82039.
 - h) Install 1/8" NPT Flush Plug PN 1607 and (2) 3/8"-16 x 1/2" Set Screws PN 1029 (use removable Loctite) into Top Bearing Cap Assembly.
 - i) Install Top Bearing Cap Assembly onto Upper Housing Cover PN 82024 using (4) 5/8"-11 x 1 1/2" HHCS PN 1157 with (4) 5/8" Lockwashers PN 1151.
- 27. Secondary Idler Gear Assembly: (2 Units Required)
 - a) Press Bearing PN 1905 into Top Tong Plate, and install Secondary Idler Gear PN 82012.
 - b) Press Bearing PN 1905 into Idler Bearing Cap PN 82013.
 - c) Install 1/8" 90° Zert PN 1002 and (2) 3/8"-16 x 1/2" Set Screws PN 1029 (use removable Loctite) into Idler Bearing Cap Assembly.
 - d) Install Idler Bearing Cap Assembly onto Upper Housing Cover PN 82024 using (3) 5/8"-11 x 1 1/4" SHCS PN 256 (use removable Loctite).
- 28. Install Upper Housing Cover PN 82024 onto Upper Housing PN 82001-S1 (welded onto Top Tong Plate PN 82001) using (2) 3/8"-16 x 1" SHCS PN 1041 and (20) 3/8"-16 x 1 1/2" HHCS PN 1049 with (20) 3/8" Lockwasher PN 1027.
- 29. Drive Gear/Detent Assembly:

Install Drive Gear PN 55084 over Motor Shaft PN 82040. Install Steel Ball PN 1906 and Plunger Spring PN A20-A1327133. Apply permanent Loctite to (1) 3/8"-16 x 1/4" Set Screw PN 1028. Install Set Screw in Drive Gear PN 55084, tighten Set Screw until good detent action is achieved. Proper adjustment is confirmed when resistance is encountered when shifting gear across detent groove on shaft.

- 30. Install Motor PN 82099 with Motor Shaft PN 82040, Polypack Seal PN 12501437, and Seal Retainer PN 55088 in Motor Box Housing Weldment using (4) 1/2"-13 x 1 1/4" HHCS PN 1111 and (4) 1/2" Lockwashers PN 1103.
- 31. Install Drive Gear PN 55084 and Motor Shaft Bearing Spacer PN 55121 with Remote Shift Shaft Assembly PN 82104, Shifting Yoke Assembly PN 45061, Washer PN 45068, and (1) 3/16" x 1" Roll Pin PN 1006 in Motor Box.
- 32. Install Motor Box Assembly onto Top Tong Plate PN 82001 using (6) 5/8"-11 x 1 1/4" HHCS PN 1156 with (6) 5/8" Lockwashers PN 1151.
- 33. Auto Shift Assembly:
 - a) Install (2) 3/16" Drive Zert PN 1004 onto Spring Housing PN 82055.
 - b) Install Spring Housing PN 82055 on rear End Cap PN 82057.
 - c) Install (30) Belville Springs PN BUCS4024, Piston Shaft PN 82056, and (28) Belville Springs PN BUCS4024 into Spring Housing Assembly.
 - d) Install 1/2" Rod Wiper PN 959-1 in front End Cap PN 2081 and install onto Spring Housing Assembly.
 - e) Install Rod Clevis PN 1099 onto Piston Shaft PN 82056 using removable Loctite.
 - f) Install Auto Shift Spring/Padeye PN 82058 onto Auto Shift Cylinder PN 82062 using 3/4"-16 NF Low Profile Nylock Nut PN 1176-B.
 - g) Install Auto Shift Cylinder PN 82062 onto Top Tong Plate Assembly using (4) 3/8"-16 x 3/4" Button Head CS PN 1061 with (4) 3/8" Hi Collar Lockwashers PN 1026.
 - h) Install rear End Cap PN 82057 that is installed on Spring Housing Assembly onto Auto Shift Spring/Padeye PN 82058 using Clevis Pin PN 82106 with (2) External Snap Rings PN 1942-A.
 - i) Install Remote Shift Shaft Assembly PN 82104 onto Rod Clevis PN 1099 using Clevis Pin PN 10041 with 1/8" x 1" S/S Cotter Pin PN 1252B.
- 34. Install Danfoss Valve PN 82098 with plumbing on Motor PN 82099.
- 35. Cage Plate Assemblies:
 - a) Install (25) Cam Follower PN SSCF1875 in Top Cage Plate PN 82004 with (25) 1/4" Drive Zert PN 1257, (25) 7/8"-14 Jam Nut PN 1178, and (25) 7/8" Lockwasher PN 1224.
 - b) Install (25) Cam Follower PN SSCF1875 in Bottom Cage Plate PN 82005 with (25) 1/4" Drive Zert PN 1257, (25) 7/8"-14 Jam Nut PN 1178, and (25) 7/8" Lockwasher PN 1224.
 - c) Fit Top Cage Plate Cam Followers into Ring Gear groove. Install (4) Drill Bushings PN 82064 into Bottom Cage Plate PN 82005. Use crane to raise Bottom Cage Plate and fit Bottom Cage Plate Cam Followers into Ring Gear groove. Install (4) 7/8"-9 x 6 1/2" SHCS PN 1283 through Top Cage Plate Assy. into Drill Bushings and Bottom Cage Plate Assy.

36. Remote Pivot Pin Assembly:

- a) Install Locking Pin Base Plate Weldment PN 1028 onto Top Cage Plate PN 82004 with (8) 3/8"-16 x 1" SHCS PN 1041 using removable Loctite.
- b) Install (2) Reversing Pin PN 82051 with O Ring PN 2-209 into Locking Pin Base Plate Weldment PN 2058, then through Top Cage Plate PN 82004.
- c) Install Locking Pin Cross Bar PN 71073 onto Locking Pin Assembly using (2) 3/8"-16 x 2 3/4" HHCS PN 145 (outer edges) with (2) 3/8" Flat Washer PN 1025 and (2) 3/8"-16 Nylock Nut PN 213, and 1/2"-13 x 2 3/4" HHCS PN 175 (middle) with (2) 1/2" Flat Washer PN 1102 and 1/2"-13 Nylock Nut PN 1087.

37. Reversing Pin Cylinder Assembly:

- a) Install Reversing Cyl. Bracket PN 82052 onto Upper Housing Cover PN 82024 using (4) 1/2"-13 x 1 1/4" HHCS PN 1111 with (4) 1/2" Lockwashers PN 166.
- b) Install (2) Reversing Cylinders PN 13606 onto Reversing Cyl. Bracket PN 82052 using (8) 1/4"-20 x 1 1/4" HHCS PN 106 with (8) 1/4"-20 Nut PN 100 and (8) 1/4" Lockwashers PN 101.

38. Cage Plate Stop Switch Assembly:

- a) Slide Bearing PN 1915 into Cam Switch Shaft PN 82087 and slide Bearing Shaft PN 2057 through Cam Switch Shaft and Bearing then install 3/16" x 1" Roll Pin PN 1006.
- b) Press (2) Garlock Bushing PN 2021 into Switch Housing PN 82060, slide Cam Switch Shaft Assembly into Switch Housing Assembly, and install 1/4" x 1" Roll Pin PN 1007-A.
- c) Press (4) Garlock Bushing PN 08DU08 into Remote Switch Arm PN 82085 and install onto Cam Switch Shaft Assembly using (2) Clevis Pin PN 82101 with (2) 1/8" x 1" SS Cotter Pin PN 1252B.
- d) Install Switch Housing and Shaft Assembly onto Remote Switch Bracket using (4) 1/2"-13 x 1" SHCS with (4) 1/2" High Collar Lockwasher PN 210.
- e) Install (3) Door Switch Assembly PN SLV1000-01 into Remote Switch Bracket PN 82084, place Cam Switch Mounting Bracket Dubbler PN 2056 on right side of Bracket, using (4) 1/4"-20 x 6" HHCS PN 2069 with (4) 1/4"-20 Nylock Nut PN 212.
- f) Install Remote Cage Plate Stop Switch Assembly onto Upper Housing Cover PN 82024 using (4) 3/8"-16 x 1" HHCS PN 1047 with (4) 3/8" Lockwasher PN 1027.

39. Door Assembly and Door Installation:

- a) Press Garlock Bushing PN 20DU16 into Top Door Plate PN 82027 (Latch Spacer welded on same corner) and Bottom Door Plate PN 82075.
- b) Slide Door Cover PN 82027-S3 into slot of Bottom Door Plate PN 82075.
- c) Slide Left Hand Torsion Spring PN 82090 onto Latch Spacer on Bottom Door Plate.

- d) Slide Door Jam Locking Pin PN 82045 into Door Jamb Lock PN82044 then into Latch Spacer on Bottom Door Plate.
- e) Install (2) 7/16" x 2" Roll Pin PN1123 into Door Jam Lock PN 82044 and Door Jam Locking Pin PN 82045.
- f) Install 1/2"-13 x 4 1/2" SHCS PN 254 into middle hole of Door Jam Lock PN 82044.
- g) Slide Right Hand Torsion Spring PN 82089 onto Latch Spacer on Top Door Plate.
- h) Slide Top Door Plate Assembly onto Door Jam Locking Pin, inserting Door Cover PN 82027-S3 into slot of Top Door Plate Assembly.
- i) Mount Tong Door Assembly on Tong. Place (2) Thrust Spacers PN 82029 and (2) Garlock Thrust Spacers PN 82033 onto Bottom Tong Plate, lining up on holes above (2) Door Doublers welded on Bottom Door Plate. Place (2) Dumbell Roller Assemblies PN 82030 (were previously assembled) on top of Garlock Thrust Spacers. Place (2) more Garlock Thrust Spacers then (2) Thrust Spacers PN 82029 on top of Dumbell Roller Assemblies lining up holes.
- j) Insert 1/8" NPT Zerts on each end of (2) Door Shafts PN 82034 and install Door Shafts through Top Door Plate Assembly, Top Tong Plate, Thrust Spacers, Garlock Thrust Spacers, Dumbell Roller Assemblies, Garlock Thrust Spacers, Thrust Spacers, Bottom Tong Plage, then Bottom Door Assembly. Bolt Door Shafts onto Bottom Door Assembly using (2) 1 1/2"-12 Jam Nut PN 1292 and onto Top Door Assembly using (2) 1 1/2"-12 Jam Nut PN 1292.
- k) Press Garlock Bushing PN 20DU16 into large hole of Bell Crank Weldment PN 82041. Install Bell Crank Shaft PN 82077 into Bell Crank Welment then Top Door Plate Assembly (use removable Loctite). Insert 1/8" NPT Zert into other end of Bell Crank Shaft and install 7/8"-9 Nylock Nut PN 1318.
- 1) Press Garlock Bushing PN 30DU16 into large hole on Top Door Plate PN 82027 and Bottom Door Plate PN 82075.
- m) Install 1/8" NPT Zert on each end of Door Shaft PN 82079. Slide Door Race PN 82102 onto Door Shaft.
- n) Install Door Shaft PN 82079 through Top Door Plate, Door Washer PN 82078, Top Tong Plate, Thrust Spacer PN 82029, Garlock Thrust Spacer PN 82033, Dumbell Roller Assembly, Garlock Thrust Spacer PN 82033, Thrust Spacer PN 82029, Bottom Tong Plate, Door Washer PN 82078, Door Race PN 82102, then Bottom Door Assembly. Bolt Door Shaft onto Bottom Door Assembly using 1 1/2"-12 Jam Nut PN 1292.
- o) Install Door Switch Adjustment Sleeve PN 82074 onto Top Door Plate Assembly. Note: Collar is cut with weld bevel and is to be welded to Top Tong Door Plate.
- p) Install (2) 3/8"-16 x 1/2" Set Screws PN 1029 (use removable Loctite) on Door Switch Adjustment Sleeve.

40. Install Linkage PN 82043 to Arm PN 82042 using 3/4" x 5/8" Shoulder Bolt PN 1676. Slide Arm onto Door Jam Locking Pin PN 82045 and install 7/16" x 2" Roll Pin PN 1123. Press Garlock Bushing PN 82046 into other end of Linkage. Install Linkage onto Bell Crank Weldment PN 82041 using 3/4" x 5/8" Shoulder Bolt PN 1676.

41. Door Cylinder Assembly:

- a) Install Rod Boot PN 14018 onto Door Cylinder PN 82080 using Clamp PN 14018-S1.
- b) Install Rod Eye Spring PN 82126 into Rod Eye Clevis PN 82116, then install Clevis onto Door Cylinder then Clamp PN 14018-S1 Rod Boot to Cylinder.
- c) Press Garlock Bushing PN 2046 into Door Cylinder Mounting Bracket PN 82048. Install Door Cylinder Assembly onto Door Cylinder Mounting Bracket using Clevis Pin PN 10041 with 1/8" x 1" SS Cotter Pin PN 1252B.
- d) Install Washer PN 82127, Rod Eye Clevis with Spring, Washer PN 82127, onto Bell Crank Weldment Shaft using 3/4"-10 Nylock Nut PN 1167.
- e) Install Door Cylinder Mounting Bracket onto Top Tong Plate PN 82001 using (3) 5/8"-11 x 2 1/2" HHCS with (3) 5/8" Lockwasher PN 1151, and 1 1/2"-12 Jam Nut PN 1292 (from Dumbell Roller Assembly).

42. Door Switch Assembly:

- a) Mount Door Switch Assembly PN SLV1000-01 on Door Switch Base Plate PN 82107-S1 with (4) 1/4"-20 x 2 1/4" HHCS PN 110, and (4) 1/4"-20 Nylock Nut PN 212.
- b) Mount Assembly to (2) Door Switch Base Mounts PN 82001-S7 (Base Mounts should be welded to Top Tong Plate) with (2) 3/8"-16 x 1" HHCS PN 1047 and (2) 3/8" Lockwashers PN 1027.

43. Door Switch Adjustment Instructions:

- a) Loosen 3/8"-16 x 1/2" Set Screws PN 1029 to align recess in Door Switch Adjustment Sleeve PN 82074 with Roller on Door Switch PN SLV1000-01. Tighten Set Screws PN 1029.
- b) Loosen 1/4"-20 Nylock Nuts PN 212 and slide Door Switch PN SLV1000-01 forward until fully seated in recess in Door Switch Adjustment Sleeve PN 82074. Tighten Nylock Nuts PN 212.
- c) Connect Tong to Power Unit and actuate motor while in low gear. Verify Ring Gear stops rotating when Tong Door is opened.

SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System Revision: 09/01	Page 4 - 10

INITIAL SETUP GUIDELINES

- 1. Establish equipment layout. Setup tong positioner in center of designated area (Ref. Fig. 1).
- 2. Insure tong positioner base is level in all directions.
- 3. Rigidly fix tong positioner to deck, rack or pillars, as appropriate to prevent inadvertent movement or misalignment.
- 4. Setup right and left pipe racks adjacent to tong positioner, insuring axis of racks is perpendicular to longitudinal axis of tong positioner. Both racks must be level and on same vertical plane.
- 5. Rigidly fix racks to deck, rack or pillars, as appropriate to prevent inadvertent movement or misalignment.
- 6. Position hydraulic power unit and control consoles as required to avoid exposing personnel to hazards of moving pipe on racks or overhead when handling with a crane.
- 7. Fully extend power unit hydraulic hoses.
- 8. Connect power unit's 1" pressure (a.k.a. supply), 1 1/4" tank (a.k.a. return) and 2" high pressure load sense hoses to appropriate quick disconnects located on back of tong positioner control console (*Ref. Fig.* 2). Double check to insure all quick disconnects are connected to their mating coupler and that they are fully seated. Note threaded, wing type quick disconnects are marked with a proper makeup line.
- 9. Connect jumper hoses from pressure, tank and load sense ports on back of tong positioner control console to appropriate mating coupler on back of pipe rack control console (*Ref. Fig. 3*). Double check to insure all quick disconnects are connected to their mating coupler and that they are fully seated. Note threaded, wing type quick disconnects are marked with a proper makeup line.
- 10. Fully extend tong positioner hoses and connect to appropriate mating coupler on back of tong positioner control console (*Ref. Fig. 2*). Double check to insure all quick disconnects are connected to their mating coupler and that they are fully seated. Note threaded, wing type quick disconnects are marked with a proper makeup line.
- 11. Fully extend pipe rack hoses and connect to appropriate mating coupler on back of pipe rack control console (*Ref. Fig. 3*). Double check to insure all quick disconnects are connected to their mating coupler and that they are fully seated. Note threaded, wing type quick disconnects are marked with a proper makeup line.

INITIAL SETUP GUIDELINES

- 12. In the event hoses are not tightened securely, possible failures to hydraulic system can occur. If pressure supply hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit, resulting in increased load and speed in the power unit.
- 13. Do not reduce size of return hose, quick disconnects or fittings. If return line hoses are restricted or flow is blocked, pressure will increase in the hydraulic power unit and the hydraulic system in the tong itself, resulting in the tong motor case pressure increasing to maximum pressure and possible motor seal failure.
- 14. Organize hose bundles and position or guard so they are not trip hazards. Protect hoses so they will not become damaged by moving equipment.

START UP INSTRUCTIONS

1. Insure tong and backup are rotated to vertical pipe position. If they are in horizontal pipe position, energize power unit and rotate to vertical pipe position using procedures listed below and in Operating Instructions - Tong and Backup Positioner Rotating Procedure.

WARNING: ALWAYS SHUTDOWN POWER UNIT and DISCONNECT SUPPLY HOSE from POWER UNIT BEFORE WORKING ON ANY PORTION OF THE SYSTEM INCLUDING CHANGING OR CHECKING JAWS OR ADAPTERS.

- 2. Determine diameter of tubular, tooljoint or BHA to be made-up or broken-out.
- 3. Refer to tong jaw and backup adapter selection chart in Section 3 to determine the appropriate jaws, adapters and dovetail strip die inserts required for this diameter. **CAUTION:** Do not attempt to use jaws or adapters outside of specified ranges. Attempting to grip oversized or undersized tubulars can result in damage to equipment and tubulars.
- 4. Check tong jaw to insure jaw, pin and roller are not damaged, and that they are free of rust and debris. All components must be well lubricated with grease containing a corrosion inhibitor. Insure jaw rollers turn freely on jaw pins. Replace worn or damaged dovetail strip die inserts. Insure die retainers are properly tightened. For tubulars requiring wrap around dies, select the proper jaw assembly and its corresponding wrap around die. Remove upper die retainer clips. Insert die into jaw. Reinstall clips and clip retainer bolts.
- 5. Check tong jaw pocket to insure it is not damaged, and that it is free of rust or debris. Thoroughly lubricate tong jaw pockets with grease containing a corrosion inhibitor.
- 6. Install tong jaws in tong jaw pockets. Attach all jaw retraction springs.
- 7. Clean splines on backup jaws to insure they are not damaged and free of rust or debris. Lubricate splines with grease containing a corrosion inhibitor.
- 8. Check dovetail die adapter to insure they are not damaged, and that they are free of rust and debris. Replace worn or damaged dovetail strip die inserts. Insure die retainer bolts and die adapter clip bolts are properly installed and fasteners tightened. For tubulars requiring wrap around dies, select the proper adapter and its corresponding wrap around die. Remove upper die retainer clips. Insert die into adapter. Install into backup and reinstall clips and clip retainer bolts.

Note: The backup uses a circular key to insure axial pipe loads do not damage adapter retainer clips. Refer to backup assembly drawings in Section 10 for cylinder, inside and outside doors. To remove an adapter you must first remove the circular key retainer set screw and then remove the circular key. Due to its recessed nature, it may be necessary to use a small diameter punch or similar device to tap the circular key from its position behind the adapter. To reinstall, use the reverse procedure installing the retainer set screw after the circular key is in place.

START UP INSTRUCTIONS

- 9. Verify tong suspension systems for vertical and horizontal operation are free to move in both directions to accommodate thread lead in makeup and breakout operations. **CAUTION:** Failure to accommodate for lead will damage tong, backup or connection. If extremely long connections must be made up or broken out, the operator will have to release and reset the tong jaws periodically to allow the suspension system springs to relax to provide more stroke.
- 10. Lubricate entire system by injecting grease into zerts located on positioner, tong and backup.
- 11. Drain condensed water from air dryer and check/add oil to air lubricator air filter/regulator/lubricator assembly (*Ref Item 43*).
- 12. If required, set up torque turn data acquisition and control computer, connect dump valve solenoid, electronic load cell and electronic turns encoder.
- 13. RECONNECT POWER UNIT SUPPLY HOSE TO TONG CONTROL CONSOLE.

DIESEL DRIVEN HYDRAULIC POWER UNIT STARTUP

- 1 Inspect all hoses for abrasions, kinks or other visible damage.
- 2. Check engine oil level, diesel fuel level and hydraulic oil level. Top up as required.
- 3. Check to verify hydraulic oil suction isolation valve is OPEN. Caution operating power unit with the suction isolation in closed position will destroy hydraulic pump.
- 4. Open fuel shutoff valve. Open and reset air intake and fuel shutdowns as required.
- 5. Connect air supply hose to tong control panel.
- 6. Connect starter air hose to engine starter and start engine. Bleed starter air hose, disconnect and stow as required.
- Allow engine and hydraulic oil to warm up ten (10) minutes before actuating any components. 7.
- 8. Check all hoses and connections for hydraulic leaks.

CAUTION: This system is designed to exclusively utilize closed center valves and a pressure compensated hydraulic pump with load sense feature. WARNING: Attempting to operate this unit with a power unit designed for open center valves will result in the power unit operating continuously at maximum pressure, will cause overheating and may cause equipment failures exposing personnel to high pressure, high temperature hydraulic fluid leaks which can result in fatalities.

9. Using Tong Control Console (Ref. Fig. 4) actuate all positioner, tong and backup controls to test all functions while checking for leaks.

Note: The **CLINCHER®** tong is equipped with a door position sensor which will prevent rotation of the tong if the door is open. A cage plate position sensor will prevent actuation of the Reversing Pin cylinders unless the cage plates are precisely positioned in the open throat condition. Note a vertical position sensor switch will prevent tong positioner rotation from horizontal to vertical position except when positioner is in maximum elevation condition. A separate rotational position sensor will prevent vertical tong positioner movement unless the tong is fully rotated to the vertical or horizontal positions.

10. Using Pipe Rack Console (Ref. Fig. 5) and Kwick Konnect's Pipe Rack System Operating Instructions, actuate all controls to test all pipe rack functions while checking for leaks.

Page 5 - 5

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SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System	
Revision: 07/01	Page 5 - 6

- 1. Determine if tong is to be used with horizontal pipe in rack or vertical pipe in false rotary. Rotate to other position if required.
- 2. Confirm proper jaws and adapters are installed.

TONG AND BACKUP POSITIONER ROTATING PROCEDURE

- 1. Using tong directional control valve (*Ref. Fig. 4, Item 16A*) slowly rotate tong ring gear and cage plates to open throat position using rotation opposite of the rotation last used. This valve is spring loaded and will return to neutral position when it is released.. Ring gear and cage plate should automatically stop at open throat position and jaws should be fully open. NOTE: Rotating at high rate of speed will overshoot open throat position. Verify cage plate and ring gear are in open throat position.
- 2. Open tong door by shifting tong door directional control valve (*Ref. Fig. 4, Item 2C*) to the "OPEN" position.
- 3. Open backup shifting backup directional control valve (*Ref. Fig. 4, Item16B*) to "OPEN" position. This valve is spring loaded and will return to neutral position when it is released.
- 4. Move tong positioner laterally to rear of structure (away from pipe) by shift positioner traverse directional control valve (*Ref. Fig. 4, Item 16F*) to the "OUT" position until the positioner clears all pipe in rack or false rotary. This valve is spring loaded and will return to neutral position when it is released.
- 5. Raise tong positioner to its uppermost position by shifting positioner elevation directional control valve (*Ref. Fig. 4, Item 16C*) to the up position until the unit stops moving. This valve is spring loaded and will return to neutral position when it is released.
- 6. Slowly rotate tong positioner to required state by shifting tong positioner rotation directional control valve (*Ref. Fig. 4, Item 16E*) as required. Continue rotating until movement stops. This valve is spring loaded and will return to neutral position when it is released.
- 7. Lower unit to lowermost position and shift in to operating position as needed using reverse procedures.

SETTING TONG OPERATION

Note: These operations may only be performed when the ring gear and cage plates are in the open throat position.

- 1. Set tong operation by shifting mode directional control valve (*Ref. Fig. 4, Item 2A*) to "Make" for make-up or "Break" for break-out. Note: This valve is detented and will remain in desired position until shifted.
- 2. Shift reversing pin to correspond to "Makeup" or "Breakout" as indicated by raising spring loaded safety guard (*Ref. Fig. 4, Item 46*) and momentarily shifting the valve corresponding to the operation required. Note: These valves are spring loaded and will return to neutral position when released causing cylinder to retract. This action will cause one of the reversing pin control cylinders (*Ref. Fig. 6, Item 28*) to momentarily extend to toggle the reversing pin into the correct location. Caution: Do not extend both cylinders simultaneously as equipment damage may result. Release the valve to allow it to return to the "NORMAL" position and release the safety guard. Note when switching the BREAKOUT operations use alternate valve (*Ref. Rig. 4, Item 3B*).
- 3. For horizontal makeup, using Pipe Rack Console (*Ref. Fig. 5*) and Kwick Konnect's Pipe Rack System Operating Instructions, load tubulars on to rack and feed first joint to second rack. Position coupling at location between the tong and backup.
- 4. Insure backup doors and tong door are open. Verify tong ring gear and cage plates are in the open throat position. Confirm tong jaws are fully retracted.
- 5. Check and adjust tong and backup's vertical height (*Ref. Fig. 4, Item 16C*) until tong and backup centerline is at same elevation at tubular's centerline. NOTE: Vertical position adjustments will be required whenever tubular diameters are changed.
- 6. Slowly move tong positioner in (*Ref. Fig. 4, Item 16F*) towards pipe until centerline of tong jaws is aligned with centerline of tubular.
- 7. Close backup on pipe by pushing panel mounted backup directional control valve (*Ref. Fig. 4, Item 16B*). Note: System Hydraulic Pressure as shown on panel mounted gauge (*Ref. Fig. 4, Item 7*) should rise to 2500 psi when backup is fully set. Release control valve handle and allow it to return to neutral position.
- 8. Close tong door by shifting directional control valve (*Ref. Fig. 4, Item 2C*) to closed position. Note: Valve is detented and will remain in closed position until opened.
- 9. Using Pipe Rack Console (Ref. Fig. 5) and Kwick Konnect's Pipe Rack System Operating Instructions, slowly feed pin thread of second joint into box thread of first joint.

- 10. Select gear ratio required by shifting tong gear directional control valve (*Ref. Fig. 4, Item 2B*). Note: Valve is detented and will remain in set position until shifted. **CAUTION:** Do not shift tong gears while the tong is rotating.
- 11. Select motor speed required by rotating motor speed directional control valve (*Ref. Fig. 4, Item 4*). Valve is detented and will remain in set position until shifted. Note: Motor speed may be changed while motor and tong are rotating.
- 12. Note: For non-critical applications, the makeup torque maybe hydraulically limited using the torque limiter valve (*Ref. Fig. 4 Item 5*). To use this feature, back out (by rotating counterclockwise) panel mounted torque limiter until it stops.
- 13. Slowly close tong jaws on pipe by shifting tong motor directional control valve (*Ref. Fig.4*, *Item 16A*) until pipe starts rotating. Note this valve has proportional response and can be used to meter or precisely control the speed of the tong by limiting the amount of hydraulic oil delivered to the motor. If required, the tong's air cylinders can be used to assist stabbing and starting thread makeup by rotating the air cylinder control valve (*Ref. Fig. 4*, *Item 42*) from the *breakout* position to the *normal* position AFTER the tong jaws have been closed on the tubular.
- 14. Verify backup pressure is still at 2500 psi as read on gage (*Ref. Rig. 4, Item 7*) by momentarily pushing backup control valve (*Ref. Fig. 4, Item 16B*) to closed position.
- 15. Continue to rotate the tong until pressure required to rotate matches setting of torque limiter (*Ref. Fig. 4, Item 5*). Slowly tighten torque limiter valve (*Ref. Fig. 4, Item 5*) until the desired torque is read on the torque gage or the torque data acquisition and control system dumps the hydraulic pressure. Note: Tong must be able to move downward to accommodate thread lead during makeup or upward during breakout. Check torques readings and torque limiter valve setting frequently to insure no other adjustment is required.
- 16. Note: In critical torque applications the torque gage should not be used to measure and control applied torque. A torque turn data acquisition and control system with automatic dump feature must be used for precise control to avoid leaks or damaged connections.

Note: It may be necessary to shift from high to low gear during some make-up operations to achieve required torque.

RELEASING TONG AND BACKUP FROM PIPE

- 1. Using tong directional control valve (*Ref. Fig. 4, Item 16A*) slowly rotate tong ring gear and cage plates to open throat position using rotation opposite of the rotation last used. Ring gear and cage plate should automatically stop at open throat position and jaws should be fully open. NOTE: Rotating at high rate of speed will overshoot open throat position.
- 2. Verify cage plate and ring gear are in open throat position. Note: Tong may move up or down when jaws release depending upon operation performed.
- 3. Open tong door by shifting tong door directional control valve (Ref. Fig. 4, Item 2C) to the "OPEN" position.
- 4/ Open backup shifting backup directional control valve (*Ref. Fig. 4, Item16B*) to "OPEN" position. Move tong positioner laterally to rear of structure (away from pipe) by shift positioner traverse directional control valve (*Ref. Fig. 4, Item 16F*) to the "OUT" position until the positioner clears all pipe in rack or false rotary.
- 5. Using Pipe Rack Console (*Ref. Fig. 5*) and Kwick Konnect's Pipe Rack System Operating Instructions, feed made-up stand of tubulars out of rack and feed in next joints for makeup.

CLINCHER® recommends that owners of **CLINCHER®** Hydraulic Power Tongs, Backups, **CHROMEMASTER**TMs, and accessories adapt a regularly scheduled maintenance program. Implementation of this type of program offers several benefits. First you increase the life of your equipment, secondly, you may find a problem before it escalates to a costly repair or down time on the job, and most important, prevent injury to operating personnel.

A major inspection (described at the end of this section) should be carried out if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out.

Routine Maintenance

Cleaning - Upon return from each and every job:

- A) Pre-wash unit to remove majority of dirt and grease build up as to allow removal of dies, and inspection of overall condition of unit.
- B) Remove and inspect dies from tong and backup. Note any missing or damaged die retainers, and/or die retainer bolts.
- C) Remove side jaws from tong and inspect side jaw for missing or broken parts, damaged splines, broken ears (locking hooks on front portion of side jaws).
- D) Clean and inspect side jaws, jaw pins, jaw rollers for damage or excessive wear. Lubricate pins and rollers, and reinstall in tong.
- E) Remove, clean (in non-flammable solvent), and inspect back jaws in tong.
- F) Check jaw pins for breakage, cracks, and uneven wear patterns. Inspect jaw rollers for cracks, breakage, and flat spots.
- G) Reassemble jaw sections replacing any damaged parts. Lubricate jaw pins and rollers using gear grease. Set aside for testing.
- H) Clean and inspect backup operating cylinder. Insure spline area is free from damage and any rust or dirt is removed. Replace any missing or damaged die retainer clips and die retainer bolts.
- I) Inspect hanger and all hoses for wear, replace as necessary.
- J) Inspect hanger assembly to assure all parts are returned and in operating condition. (*i.e.* H-Plates, spring, leg springs, leg spring caps and pins)
- K) Replace jaw pins and rollers in tong.
- L) Lubricate tong's cam followers (upper and lower), dumbell roller shafts (upper and lower zerts), door shaft, center idler gear shaft, outboard idler gear shafts (3), pinion gear and secondary gear assemblies (Pinion gear and secondary gear assemblies are installed with sealed bearings. There are no provisions to grease these bearings. However, if replaced by non-sealed bearings, the 1/8" NPT flush plugs should be replaced with zerts PN 1001 and both gear assemblies should be added to the regular lubrication schedule.), low gear housing, and shift housing (2 zerts each), and re-pack tong body cavity. Lubricate zerts in backup plates and pins.

- M) Install dies of a size needed for testing purposes, and attach hydraulic power unit to tong. Before energizing power unit make certain no one is working on tong or backup and all tools and parts are removed from the tong and backup.
- N) Insert test mandrel of the exact same size as the dies which are installed in the tong and backup. **Caution:** Testing the function of the backup without the proper size dies installed and/or without

the proper size mandrel in place, you risk serious damage to the backup cylinder.

- O) After power unit has reached operating RPM and temperature, operate the backup control valve and close backup around test mandrel using sufficient flow and pressure to clamp mandrel and maintain pressure to backup. (Recommended operating pressure of 2,500 psi.) Backup pressure gauge should match system operating pressure. After release of control valve you may experience a slight drop in backup pressure (up to 300 psi), this is normal. If backup pressure drops more than 300 psi within 2 minutes, you may be experiencing a hydraulic leak.
- P) While maintaining pressure on backup visually inspect hoses, stainless steel lines, fittings, etc., for seepage of hydraulic fluid. Repair or replace parts causing leaks. If you see no visible external leaks and your backup is still losing pressure, there may be an internal leak in the operating cylinder or load holding valve allowing fluid to bypass the piston. It is recommended that the backup be returned to the manufacturer for repair.
- Q) If at this time your backup is functioning correctly, open and close unit several times to insure consistent operation.
- R) With the proper dies installed in the tong and backup, and test mandrel locked in the backup, place reversing pin into the make-up position, set tong into low gear and operate tong through several cycles of locking, biting, and torqueing to required torque. Change reversing pin to break-out position and repeat. Repeat same procedure in high gear.
 - Note: Torque developed in high gear is considerably less than torque developed in low gear.
- S) Test door interlock system by opening door slightly with tong rotating. (Remove test mandrel for this procedure.) The tongs rotation should stop. If tong rotation fails to stop, close door, cease rotation, deactivate power unit, and inspect door interlock switch for damage. Insure that adjustment collar is oriented to allow wheel of door switch to fit into recess on collar.
 - Warning: If door switch system is not functioning properly tong must not be used.
- T) Reinspect tong and backup hydraulic system for leaks.
- U) If at this time the unit is functioning as intended, replace all covers and grease splines in tong and backup (side jaws and back jaws), tape or grease spools on control valves (to prevent paint from adhering to polished spool surface), prime and paint unit for storage.

Recommended Lubrication Schedule Performed after Completion of Each Job

Hydraulic Tong

- A) Cam followers: upper and lower (all)
- B) Dumbell roller shafts: (all)
- C) Door shaft
- D) Idler shafts (4)
- E) Shift housing (2 zerts)
- F) Re-pack tong cavity
- G) Pinion gear shaft
- H) Jaw rollers and pins. Remove jaw pins and rollers, clean and lubricate with gear grease.
- I) Inspect hydraulic fluid for foreign material and contaminants. Filter or replace. You must filter or replace entire system including power unit tank and lines along with tong to insure all contaminants are removed.

Annual Major Maintenance

Inspection and Repair

Routine preventative maintenance will significantly extend the operating life of your equipment, reduce operating cost and avoid downtime. **CLINCHER®** recommends a program of frequent routine inspection, and if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out, perform the following:

- A) Visually inspect components on power tong which could possibly have been damaged either during operation or transit. *i.e.* Damage to hanger assembly, mounting legs, or hydraulic valve assembly.
- B) Check test date. Ensure that a load test and inspection was carried out within the last 9 months.
- C) Check ring gear. Check for any signs of damage or wear.
- D) Remove motor and valve assembly from tong body.
- E) Check motor seal. Apply hydraulic power, run motor and visually check motor seal for any signs of leakage.
- F) Check drive gear, high and low pinion gears. Check for excessive sign of wear on motor gear.
- G) Check condition of control valve spools. Activate valves and check for any sign of wear, pitting, or scoring of the chrome surface of spools. If spool is damaged in any way, the complete section must be changed out. Spools are not interchangeable.

Recommended Lubrication Schedule Performed after Completion of Each Job

Hydraulic Tong

- A) Cam followers: upper and lower (all)
- B) Dumbell roller shafts: (all)
- C) Door shaft
- D) Idler shafts (4)
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- H) Jaw rollers and pins. Remove jaw pins and rollers, clean and lubricate with gear grease.
- Inspect hydraulic fluid for foreign material and contaminants. Filter or replace. You must filter
 or replace entire system including power unit tank and lines along with tong to insure all
 contaminants are removed.

Annual Major Maintenance

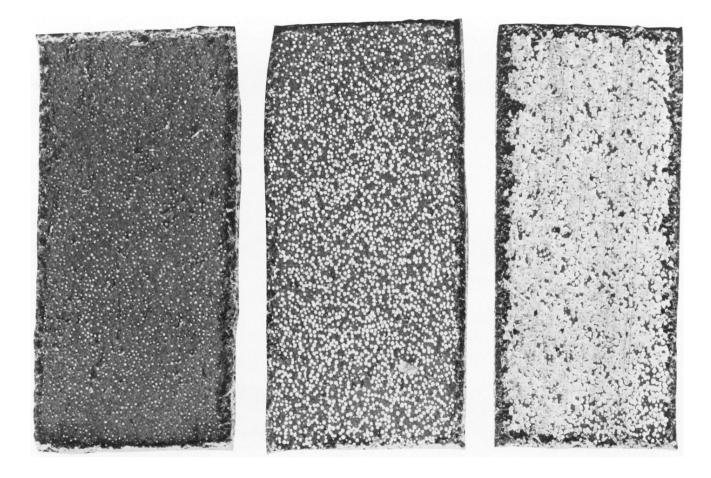
Inspection and Repair

Routine preventative maintenance will significantly extend the operating life of your equipment, reduce operating cost and avoid downtime. CLINCHER recommends a program of frequent routine inspection, and if equipment is suspected to have been damaged during transit or is to be mobilized to a remote location where maintenance operations are difficult to carry out, perform the following:

- A) Visually inspect components on power tong which could possibly have been damaged either during operation or transit. *i.e.* Damage to hanger assembly, mounting legs, or hydraulic valve assembly.
- B) Check test date. Ensure that a load test and inspection was carried out within the last 9 months.
- C) Check ring gear. Check for any signs of damage or wear.
- D) Remove motor and valve assembly from tong body.
- E) Check motor seal. Apply hydraulic power, run motor and visually check motor seal for any signs of leakage.
- F) Check drive gear, high and low pinion gears. Check for excessive sign of wear on motor gear.
- G) Check condition of control valve spools. Activate valves and check for any sign of wear, pitting, or scoring of the chrome surface of spools. If spool is damaged in any way, the complete section must be changed out. Spools are not interchangeable.

- H) Check gear selector and shaft. Visually inspect shifting shaft for alignment and straightness.
- I) Check Hi/Low Gear assembly. Visually inspect high and low clutch and gears for any sign of chipped, broken, or worn teeth.
- J) Check dumbell rollers, shafts, and bushings. Check for excess movement on either bearings, bushings, shafts, or dumbells.
- K) Check idler gears and center pinion shaft gears and bearings. Check that there are no signs of worn, chipped, or broken teeth on idler and center pinion shaft gears.
- L) Check door bearings. Visually check excess movement on bearings at door assembly. If excess movement is found, door must be removed making careful note of bearing washer positions for reassembly.
- M) Check door switch system. Visually check that door switch valve has sufficient strength to hold door in closed position. If this is not the case, then repairs are required.
- N) Check door safety device. Functionally check tong door safety switch. Engage low gear, open tong door and push rotor control lever forward as if to rotate rotor. If safety device is operational then the rotor will not rotate.
- O) Check lifting hanger test date. Check lifting hanger for damage. Ensure that a load test and inspection was carried out within the last 9 months.
- P) Check condition of all hydraulic hoses and fittings. Visually inspect all hydraulic hoses fitted to the tong for any signs of leaks, cuts, or wear.
- Q) Reinstall all parts which were removed for inspection and/or damage. Connect to hydraulic power supply and function test operation of tong in high, low, forward, and reverse. Torque test utilizing appropriate dies and test mandrel. Test operation of lift cylinder.
- R) Inspect power unit system according to manufactures specifications.
- S) Lubricate tong according to maintenance schedule preceding this section.
- T) Paint, remembering to mask off surfaces not intending to paint with grease or masking tape.
- U) Complete dated inspection report giving details of all duties performed along with complete list of items replaced.

DU® BEARING DRY WEAR PROCESS



- 1. 2. 3.
- 1. Running-in completed. Low wear rate starts when up to 10% of the bronze is exposed.
- 2. Typical surface appearance when DU $^{\rm @}$ bearing approaches its half life with 40% to 50% of the bronze exposed.
- 3. Bronze is beginning to smear near the end of DU's useful life as a dry bearing. Over 75% of the bronze is visible at the surface.

For additional information about DU bearings, please contact Garlock Bearings Inc, 700 Mid Atlantic Parkway, Thorofare, New Jersey 08086. **(609) 848-3200** FAX: (609) 848-5115

Coltec Industries



Garlock Bearings Inc

HYDRAULIC SYSTEM

Hydraulic Pump Making Excessive Noise:

	Problem	Solution
A)	Restricted or clogged intake line	Clean line, check for contamination.
B)	Contaminated fluid	Flush system, change fluid.
C)	Restricted vent	Clean or replace air vent.
D)	Air in fluid	Check for leaks and be certain fluid suction in tank is well below hydraulic fluid in reservoir.
E)	Damaged or worn parts	Repair or replace damaged parts, check fluid for contamination.
F)	Excessive RPM	Check PTO, gears, and recommended speed to assure proper pump is installed for operation.
G)	Increased friction	Make sure pump has been assembled using correct torque valves.
H)	Damaged or worn relief valve.	Replace relief valve.
I)	Damaged or worn check valve.	Replace check valve.
J)	Restricted discharge	Check to make sure relief valve is set to proper pressure.
K)	Valve system restricted	Inspect and repair or replace defective parts, check system for contamination.

Excessive Wear to Hydraulic Components:

Problem Solution A) Fluid contamination Flush fluid system, replace with new fluid. B) Components misaligned Inspect and realign. C) High operating pressures Gauge and set to proper pressure. Exhausted fluid (depletion of additives) Flush fluid system, replace with new D) fluid. E) Air in fluid Check for leaks, and be certain fluid suction in tank is well below hydraulic fluid in reservoir. F) Shortened bearing life Check alignment, insure proper lubrication to non-sealed bearings.

HYDRAULIC TONG SECTION

Slow Tong Speed:

	<u>Problem</u>	Solution
A)	Restricted supply line	Clear supply line and check intake on reservoir.
B)	Low fluid level	Add fluid to proper volume.
C)	Air leak	Locate and repair leak.
D)	Pump speed insufficient	Assure proper pump speed for application.
E)	Damaged or worn equipment	Isolate pump and check pressure to determine whether motor or pump is defective. Repair or replace defective part.
F)	Pump not primed	Check fluid viscosity and restrictions of intake line. Replace fluid if inadequate for operating temperature.
G)	Low or no flow from supply line	Check to assure couplings are securely fastened.
H)	Hydraulic bypass valve malfunction	Inspect. Adjust unloading pressure. Replace or repair as necessary.

Insufficient Torque:

<u>Problem</u>	Solution
Door switch malfunctioning	Check to make sure door is completely closed. Inspect door switch and dump valve. Replace or repair door switch and/or dump valve.
Relief valve malfunctioning	Relief set too low, broken valve spring, contamination or defective seals.
Damaged or worn pump parts	Inspect, repair, or replace.
Slow pump speed	Assure proper pump speed for application.
Improper system fluid	Check fluid viscosity and replace fluid if inadequate for operating temperature.
Directional control valve set improperly	Check relief and directional control valve. Neutral should return slightly to reservoir.
	Door switch malfunctioning Relief valve malfunctioning Damaged or worn pump parts Slow pump speed Improper system fluid

Hyd	Hydraulic Tong System:		
	<u>Problem</u>	Solution	
A)	Damage to motor	Inspect, repair, or replace.	
B)	Restriction of supply line, excessive back pressure	Check to assure couplings are securely fastened.	
C)	Defective gauge or load cell	Inspect, repair, or replace. Assure unit has been calibrated to proper arm length. NOTE: When using CLINCHER® integral backup system, it is the length of backup arm, NOT the tong arm length.	

Difficulty Shifting Gears:

<u>Problem</u> <u>Solution</u>

- A) Broken key in shifting yoke Inspect and replace key stock in shifting yoke.
- B) Worn or damaged shifting yoke pins Inspect and replace broken or worn pins.
- C) Insufficient lubrication Pump grease into both zerts located on shift housing.
 - Detent ball bearing spring set too tight Inspect and relieve pressure by adjusting set screw on shifting gear PN 55084.

Failure to Grip Tubulars:

Problem Solution

- A) Jaws move out from neutral, but fail to penetrate pipe. Tong not perpendicular.
- B) Jaws fail to move out of neutral. Brake band not tight enough, faulty cam followers, rust debris or damage to jaws.
- C) Tong will not release from tubular. Brake band not tight enough, defective cam followers in cage plate, insufficient lubrication to jaw pin and roller.
- D) Tong motor runs but ring gear does not rotate. Broken gears or defective shift in hydraulic tongs system.
- E) Tong binds under light load. Worn or damaged cam followers, dumbell roller bearing, or idler bearing.

Inspect die size and replace with correct dies for pipe. Wrong size dies for tubulars. Assure suspension of tong is perpendicular to tubulars. Adjust hanger as necessary.

Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear, flats, and lubrication. Repair, replace, and lubricate as needed.

Inspect for excessive wear on brake band. Inspect and replace defective cam followers. Remove rust and debris from jaws, and jaw pockets. Inspect jaw rollers and pins for wear, flats, and lubrication. Repair, replace, and lubricate as needed.

Inspect and replace defective gears. Inspect and repair or replace defective shifting parts.

Inspect and replace defective parts.

Failure to Grip Tubulars:

	<u>Problem</u>	<u>Solution</u>
F)	Ring gear rotates while control lever is in neutral.	Replace control valve.
G)	Shift will not stay in set position. Lost detent ball or spring.	Replace detent ball and spring.
H)	Hydraulic fluid leaking from motor. Damaged or worn motor shaft seal	Replace motor shaft seal.

HYDRAULIC BACKUP SYSTEM

	<u>Problem</u>	Solution
A)	Incorrect die for size tubular	Check pipe OD and match die size to pipe OD.
B)	Dies have material compacted in tooth area; worn teeth.	Clean dies with wire brush and inspect. Replace with new dies if necessary.
C)	Power unit pressure set incorrectly	Inspect relief valve on power unit to make sure enough system pressure is being delivered to backup.
D)	Counter balance valve not holding pressure	Remove side plates on backup. Bench test and replace the defective counter balance valve.
E)	Internal leakage in backup cylinder	Disconnect lines and bench test cylinder. Repair or replace as necessary.
F)	Jaws will not retract. Counter balance valve is stuck.	Replace counter balance valve.
G)	External leakage of cylinder	Repair or replace cylinder.
H)	Control valve set to neutral, but jaws extend.	Inspect control valve for damage and/or incorrect spool. Repair or replace as necessary.

SUPERIOR Manufacturing & Hydraulics, Inc.	
9 5/8" Hydraulic Tong Positioner System Revision: 07/01	Page 6 - 10

SECTION 7 RECOMMENDED SPARE PARTS LIST FOR REMOTE AREAS

Quantity	Part Number	Description
1	12501437	Seal for Rineer Motor
2	82066	Dovetail & Splined Jaw Pins
2	82072	Low Friction Jaw Pins
2	82067	Dovetail & Splined Jaw Rollers
2	82071	Low Friction Jaw Rollers
8	1001	1/8" NPT Zerts
1	SLV1000-01	Door Switch
1	45061	Shifting Yoke Assembly
1	82053	Brake Band Assembly
2	BUCDP9651	Backup Door Pivoting Insert Spring
2	BUCDP9610	Backup Door Rollers

SECTION 7 PARTS LISTS TABLE OF CONTENTS

HYTOPS9625DP / 9 5/8" DRILL PIPE HYD. TONG POSITIONER SYSTEM	7 - 3
TONG PARTS LISTS	7A
BACKUP PARTS LISTS	7B
SUSPENSION SYSTEM PARTS LISTS	7C

Pick List

HYTOPS9625DP / 9 5/8" DRILL PIPE

Part Number	Description	U/M	Bin/ Location	Quantity Quant to Pull Pulle	
1171	LOCKWASHER 3/4" GR8	each		8	
1183	HHCS 3/4"-10 X 2 1/2"	each		8	
1210	NUT 1"-8 GR8	each		2	
1218	1" LOCKWASHER GR8	each		2	
1291	HHCS 1"-8 X 4" GR8	each		2	
BUCDP9625	9 5/8 LJ DRILL PIPE BACKUP PICKLIST	each		1	
CLE9625DP	9 5/8" XHT DP TONG 120K PICKLIST	each		1	
HTS9603	BASE WELDMENT PICKLIST	each		1	
HTS9604	VERTICAL CARRIAGE ASSEMBLY PICKLIST	each		1	
HTS9605	HORIZONTAL CARRIAGE ASSEMBLY PICKLIST	each		1	
HTS9609	ROTATION BAR	each		1	
HTS9616	PIVOT CYLINDER ASSEMBLY PICKLIST	each		2	
HTS9665	TONG/BACKUP MOUNTING ASSM. PICKLIST	each		1	

SI	Page 7 - 4	

SECTION 7 PARTS LISTS TABLE OF CONTENTS

SECTION 7A CLE9625DP XHT DRILL PIPE TONG PARTS LISTS

CLE9625DP / 9 5/8" XHT DP TONG 120K	7A - 3
82001 / TOP TONG PLATE WELDMENT	7A - 11
82002 / BOTTOM TONG PLATE WELDMENT	7A - 11
82007-02 / SMART GEAR ASSEMBLY	7A - 12
82083 / TONG DOOR ASSEMBLY	7A - 12
KITBOLT-23 / BOLT KIT F/CLE9625DP	7A - 13
KITBRG-23 / BEARING KIT F/CLE9625DP	7A - 16
SLV1000-01 / N.C. SELF LUBRICATED VALVE	7A - 18
SSCF1875 / 1 7/8" SEVERE SERVICE CAM FOLLOWER	7A - 18
CJDT9663 / 9 5/8" X 6 3/8" DOVETAIL JAW SET	7A - 19
CJDT9672 / 9 5/8" X 7 1/4" DOVETAIL JAW SET	7A - 19
CJDT9675 / 9 5/8" X 7 1/2 DOVETAIL JAW SET	7A - 20
CJDT9680 / 9 5/8" X 8" DOVETAIL JAW SET	7A - 20
CJDT9685 / 9 5/8" X 8 1/2" DOVETAIL JAW SET	
CJDT9691 / 9 5/8" X 9 1/8" DOVETAIL JAW SET	7A - 21
CJDT9696 / 9 5/8" X 9 5/8" DOVETAIL JAW SET	7A - 22
CJ-9686 / 9 5/8" X 8 5/8" SPLINED JAW SET	7A - 23
CJ-LF9655 / 9 5/8" X 5 1/2" LOW FRICTION JAW SET	7A - 23

Revision: 03/03



Pick List

CLE9625DP / 9 5/8" XHT DP TONG 120K

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
00CLE9625DP	PICKLIST F/ 9 5/8" DP TONG REMOTE F/HYTOPS REV DATE: 03/04/03	each		1
10041	CLEVIS PIN-CLP-172S	each	M1-B	1
10060	ELBOW FLANGE W168-16-20U SAE CODE 61 1-1/4" 4 BOLT ELBOW FLANGE W/1" NPT	each	M1-B	2
1099	ROD CLEVIS-RC-0605	each	51	1
12501437	POLYPACK 1/8" CROSS SECTION 1 7/16 X 1 11/16 X 1/8	each	O1-A	1
1273	JAM NUT 1 1/2"-12 NYLOCK NF LOW PRO	each	54	38
1311	SPRING PLUNGER	each	54	2
13606	REVERSING PIN CYLINDER 1 1/2" B, 2"S W/5/8"R STAINLESS ROD	each	M1-C	2
14018	ROD BOOTS F/ CYLINDER H-1 1/2AO2-3-1-P1 W/ THIN BAND (1/4")	each	M1-C	1
14018-S1	WORM DRIVE HOSE CLAMP 15/16" TO 1 1/2" #5321K24	each	M1-C	2
1607	FLUSH PLUG 1/8" NPT	each	S4-G	6
1611	FLUSH PLUG 1" MNPT	each	S4-G	1
1676	SHOULDER BOLT 3/4" X 5/8" L 18-8 SS 5/8-11 THREAD	each	S5-B	2
2-209	O RING-11/16"ID 15/16"OD 1/8"WIDTH	each	O2-E	2
2056	CAM SWITCH MOUNTING BRACKET DUBBLER	each	M2-D	1
2057	BEARING SHAFT F/REVERSING PIN SYSTEM(20" CASING TONG	each	M2-D	1
2058	LOCKING PIN BASE PLATE WELD. F/20" CASING TONG PICKLIST	each		1
2072	REV. PIN CYL. STOP SPACER F/CLE2000-02	each		2

Pick List

CLE9625DP / 9 5/8" XHT DP TONG 120K

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
2081	END CAP F/AUTO SHIFT ASSY. 20" CASING TONG	each		1
40034	COVER PLATE - SQUARE	each	М3-С	1
416664	OIL SEAL 3.50 O.D. X 2.75 I.D. X .375	each		1
45061	SHIFTING YOKE WELDMENT PICKLIST REPLACED W/ 45091 SHIFT ASSY.	each	M4-B	1
45068	WASHER	each	M4-B	1
51031	ENCODER COUPLING MOUNT	each	M4-E	1
51075	ENCODER MOUNTING PLATE	each	M4-F	1
55084	OBSOLETE REP. BY PN:55084-02 DRIVE GEAR		M6-B	1
55088	MOTOR SHAFT SEAL RETAINER	each	M6-B	1
55121	MOTOR SHAFT BRNG. SPACE OBSOLETE REPLACED W/55121-01	each	M6-C	1
71071	LOCKING PIN BASE PLATE F/ 7 5/8 LOCKJAW TONG	each	M8-A	2
71073	LOCKING PIN CROSS BAR 7 5/8" LOCKJAW TONG	each	M8-A	1
82001	TOP TONG PLATE WELDMENT F/CLE9625DP TONG PICKLIST	each		1
82001-S11	BEARING CAP F/THIRD STAGE PINION	each		3
82002	BOTTOM TONG PLATE WELD. F/CLE9625DP TONG PICKLIST	each		1
82003	MID BODY WELDMENT F/CLE9625DP TONG PICKLIST	each		1
82004	TOP CAGE PLATE F/CLE9625DP TONG	each		1
82005	BOTTOM CAGE PLATE F/CLE9625DP TONG	each		1

Pick List

CLE9625DP / 9 5/8" XHT DP TONG 120K

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
82006	RING GEAR F/CLE9625DP TONG	each		1
82007-02	SMART GEAR ASSEMBLY 20 TOOTH INTERNAL SPLINE	each		2
82008	MOTOR BOX WELDMENT F/CLE9625DP TONG PICKLIST	each		1
82011-02	THIRD STAGE PINION F/ 9 5/8 DP TONG	each		2
82012	SECONDARY IDLER F/CLE9625DP TONG	each	M23-D	2
82013	IDLER BEARING CAP F/CLE9625DP TONG	each		2
82015	TOP CLUSTER BRNG. CAP F/CLE9625DP TONG	each		1
82016	BOTTOM CLUSTER BRNG. CAP F/CLE9625DP TONG	each		1
82019	SMART GEAR SPACER F/CLE9625DP TONG	each		2
82021	BOTTOM PINION CAP F/CLE9625DP TONG	each		3
82023	HIGH GEAR F/CLE9625DP TONG	each		1
82024	UPPER HOUSING COVER F/CLE9625DP TONG	each		1
82025	TURNS COUNTER BRNG. CAP F/CLE9625DP 120K TONG	each		1
82026-02	LOW GEAR F/ 9 5/8 DP TONG	each		1
82028	DUMBELL SHAFT F/CLE9625DP TONG	each	M10-F	6
82029	METALLIC THRUST SPACER F/CLE9625DP TONG	each	M11-A	24
82030	DUMBELL ROLLER F/CLE9625DP TONG	each		12
82030A	INNER RACE F/CLE9625DP TONG	each		12

Pick List

CLE9625DP / 9 5/8" XHT DP TONG 120K

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
82033	GARLOCK THRUST SPACER F/CLE9625DP TONG WATERCUT	each	M11-A	24	
82034	TONG DOOR SHAFT WELDMENT F/CLE9625DP TONG PICKLIST	each		2	
82035-02	LOW DRIVE GEAR F/9 5/8 DP TONG	each		1	
82036	IDLER GEAR F/CLE9625DP TONG	each	M23-D	4	
82037	IDLER RACE F/CLE9625DP TONG	each		8	
82038	IDLER SHAFT F/CLE9625DP TONG	each		4	
82039	THIRD STAGE BRNG. CAP F/CLE9625DP TONG	each		2	
82040	MOTOR SHAFT F/CLE9625DP TONG	each	M10-F	1	
82041	BELL CRANK WELDMENT F/TONG CLE9625DP (PICK LIST)	each		1	
82042	ARM F/CLE9625DP TONG	each		1	
82043	LINKAGE F/CLE9625DP TONG	each		1	
82044	DOOR JAMB LOCK F/CLE9625DP TONG	each		1	
82045	DOOR JAMB LOCK PIN F/CLE9625DP TONG	each		1	
82048	DOOR CYL REAR MTNG. BRKT. WELDMENT F/CLE9625DP TONG PICKLIST	each		1	
82051	REVERSING PIN F/CLE9625DP TONG	each	M10-F	2	
82052	REV. CYL. BRACKET WELDMENT F/CLE9625DP TONG PICKLIST	each		1	

Pick List

CLE9625DP / 9 5/8" XHT DP TONG 120K

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
82053	TOP BRAKE BAND WELDMENT F/CLE9625DP TONG PICKLIST	each	S10-D	1
82054	DUMBELL SHAFT BRAKE LUG F/CLE9625DP TONG PICKLIST	each		2
82055	SPRING HOUSING F/AUTO SHIFT SPRING HSNG F/CLE9625DP TONG	each		1
82056	PISTON SHAFT F/AUTO SHIFT SPRING HSNG F/CLE9625DP TONG	each		1
82057	END CAP F/AUTO SHIFT SPRING HOUSING F/CLE9625DP TONG	each		1
82058	AUTOSHIFT/SPRING PADEYE F/CLE9625DP TONG PICKLIST	each		1
82059	WEDGE BLOCK F/CLE9625DP TONG	each		1
82060	SWITCH HOUSING F/CLE9625DP TONG	each		1
82061	DOOR JAMB CLE9625DP TONG	each		1
82062	AUTO SHIFT CYL. LH-1 1/2 W02-2 1/4-1-4 F/CLE9625DP TONG	each		1
82063	IDLER SPACER F/CLE9625DP TONG	each		8
82064	BUSHING, DRILL - TYPE L F/CLE9625DP TONG	each		4
82073	MOTOR SHAFT BRNG. MNT. F/CLE9625DP TONG PICKLIS	each		1
82074	DOOR SWITCH AJUST. COLLAR F/CLE9625DP TONG	each		1
82077-1	BELL CRANK SHAFT FOR CLE9625 DP TONG	each		1
82077-2	BELL CRANK SHAFT WASHER F/ CLE9625 DP TONG	each		1

Pick List

CLE9625DP / 9 5/8" XHT DP TONG 120K

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
82077-3	BELL CRANK SHAFT WASHER .045 THICK F/CLE9625 DP TONG	each		1 _	
82078	DOOR WASHER F/CLE9625DP TONG	each		2 _	
82079	DOOR SHAFT F/CLE9625DP TONG	each		1 _	
82080	DOOR CYLINDER LH-2 B01-6-1-P1 F/CLE9625DP TONG	each	WALL17	1 _	
82083	TONG DOOR ASSEMBLY PICKLIST	each		1 _	
82084	REMOTE SWITCH BRACKET F/CLE9625DP TONG PICKLIST	each		1 _	
82085	REMOTE SWITCH ARM F/CLE9625DP TONG PICKLIST	each		1 _	
82087	CAM SWITCH SHAFT F/CLE9625DP TONG	each		1 _	
82088	RETRACT SPRING F/CLE9625DP TONG	each		8 _	
82089	RIGHT HAND TORSION SPRING F/CLE9625DP TONG	each		1 _	
82090	LEFT HAND TORSION SPRING F/CLE9625 DP TONG	each		1 _	
82096	LOWER SMART GEAR SPACER F/CLE9625DP TONG	each		2 _	
82098	DANFOSS VALVE PVG120(1) + PVG32(4)	each		1 _	
82099	RINEER MOTOR-DOUBLE STACK 21 CU.IN/REV. 2 SPEED W/SUPERIOR SHAFT #82040	each	S1-C	1 _	
82100	HIGH GEAR IDLER F/CLE9625DP TONG	each	M11-A	1 _	
82101	STAINLESS CLEVIS PIN	each	M10-F	3 _	
82102	DOOR RACE F/CLE9625 DP TONG	each		2 _	

Pick List

CLE9625DP / 9 5/8" XHT DP TONG 120K

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
82104	REMOTE SHIFT SHAFT ASSY. F/CLE9625DP TONG PICKLIST	each	M10-F	1
82105	MANIFOLD PLATE WELDMENT F/CLE9625DP TONG PICKLIST	each		1
82106	CLEVIS PIN F/CLE9625DP TONG	each		1
82107-S1	BASE PLATE F/CLE9625DP TONG	each		1
82108	ADJUSTMENT BOLT F/CLE9625DP BRAKE BAND	each		2
82109	HOSE BRACKET F/CLE9625DP TONG	each	M10-F	1
82110	HOSE BRACKET F/CLE9625DP TONG	each	M10-F	3
82112	GUARD WELDMENT F/CLE9625DP TONG DOOR (PICKLIST)	each		1
82113	ENCODER COUPLING F/CLE9625DP TONG	each	M10-F	1
82114	SHIFT GEAR SPACER F/TONG CLE9625DP	each		1
82115	DOOR CYL. MOUNT DUMBELL SHAFT F/TONG CLE9625DP PICKLIST	each		1
82116	ROD EYE	each		1
82118	STOP TUBE F/CLE9625DP TONG	each		1
82119	DOOR FLAP F/TONG CLE9625DP 3/16 NI DIAPHRAM 12" SQ.	each		1
82121	DOOR FLAP RETAINER F/ TONG CLE9625DP	each		1
82126	ROD EYE SPRING F/TONG CLE9625DP	each		1
82127	WASHER F/TONG CLE9625DP	each		2

Pick List

CLE9625DP / 9 5/8" XHT DP TONG 120K

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
82128	BOTTOM BRAKE BAND WELD. W/ RETAINER FOR CLE9625DP	each	S10-D	1
82142	SECOND STAGE PINION F/9 5/8 DP TONG	each	M23-C	1
82143	SPACER F/ 9 5/8 DP TONG	each		1
82144	TOP CLUSTER SPACER F/ 9 5/8 DP TONG	each		1
959-1	1/2" ROD WIPER	each	O3-F	1
BUCS4024	B1000-035 BELVILLE SPRING B4-25-89	each	M14-C	58
HTS9620	LEFT LOAD CELL BRACKET PICKLIST	each		1
HTS9621	RIGHT LOAD CELL BRACKET PICKLIST	each		1
J3000	CANNED WIPER	each	O4-C	2
KITBOLT-23	BOLT KIT F/CLE9625DP 9 5/8" DRILL PIPE TONG 120K	each		1
KITBRG-23	BEARING KIT F/CLE9625DP 9 5/8" DRILL PIPE TONG 120K	each		1
SLV1000-01	N.C. SELF LUBRICATED VALVE NORMALLY CLOSED/DOOR S PICKLIST	each	M19-C	4

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SUPERIOR MANUFACTURING

Pick List

82001 / TOP TONG PLATE WELDMENT

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
82001-S1	UPPER HOUSING F/CLE9625DP TONG (PICKLIST)	each		1	
82001-S10	DOOR STOP F/TONG CLE9625DP	each		1	
82001-S3	BEARING DOUBLER F/CLE9625DP TONG	each		2	
82001-S5	BRAKE BAND PIN F/CLE9625DP TONG	each		1	
82001-S6	AUTO SHIFT GUIDE F/CLE9625DP TONG	each		1	
82001-S7	DOOR SWITCH BASE MOUNT F/CLE9625DP TONG	each		2	
82001-S8	BRAKE BAND RETAINER F/CLE9625DP TONG	each		2	
RMFAB82001	TOP TONG PLATE F/CLE9625DP TONG	each		1	

13-Jun-01 10:45 AM

SUPERIOR MANUFACTURING

Pick List

82002 / BOTTOM TONG PLATE WELDMENT

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
45067-S7	DOOR SWITCH BASE MOUNT	each	22-D (W#2)	2 .	
82001-S5	BRAKE BAND PIN F/CLE9625DP TONG	each		1.	
82002-S2	BOTTOM TONG PLATE F/CLE9625DP TONG	each		1.	

Pick List

82007-02 / SMART GEAR ASSEMBLY

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
0082007-02	PICKLIST FOR 82007-02 20 TOOTH INTERNAL SPLINE SEE NOTES F/82007-02	each		1	
1154	SHCS 5/8"-11 X 1 3/4"	each	51	5	
82007A	RING GEAR F/82007 SMART GEAR ASSY. CLE9625DP TONG	each		1	
82007B-02	TOP SPLINED PLATE F/ SMART GEAR ASSEMBLY	each		1	
82007C-02	BOTTOM SPLINED PLATE F/ 9 5/8 DP TONG SMART GEAR	each		1	
82007D	BELLVILLE SHAFT F/CLE9625DP TONG	each		10	
82010	BELLVILLE SPRING F/CLE9625DP TONG B1500-102	each	M10-F	60	
82010-B	FLATWASHER 1/8" THICK 1 1/2" OD 1/2" ID	each		20	

13-Jun-01 10:58 AM

SUPERIOR MANUFACTURING

Pick List

82083 / TONG DOOR ASSEMBLY

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
82027	TOP TONG DOOR WELDMENT F/CLE9625DP TONG (PICKLIST)	each		1	
82027-S3	DOOR COVER F/CLE9625DP TONG	each		1	
82075	BOTTOM DOOR PLATE WELDMENT F/CLE9625DP TONG (PICKLIST)	each		1	

Pick List

KITBOLT-23 / BOLT KIT F/CLE9625DP

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
00KITBOLT23	PICKLIST FOR KITBOLT-23 REV DATE: 03/04/03	each		1
100	NUT 1/4"-20 GR.8	each	55	8
1001	ZERT 1/8" NPT	each	50	27
1002	ZERT 90 DEG. 1/8" NPT	each	50	3
1004	DRIVE ZERT 3/16"	each	50	2
1006	ROLL PIN 3/16" X 1"	each	50	2
1007-A	ROLL PIN 1/4" X 1"	each	50	1
1008-B	SET SCREW 1/4"-20 X 1/4"	each	50	8
101	LOCKWASHER 1/4" GR8	each	55	8
1025	FLATWASHER 3/8" GR8	each	50	2
1026	HI COLLAR LOCKWASHER 3/8	each	50	4
1027	LOCKWASHER 3/8" GR8 (134)	each	50	30
1029	SET SCREW 3/8"-16 X 1/2"	each	50	20
1034	SET SCREW 1/4" #10-32	each	50	1
1041	SHCS 3/8"-16 X 1"	each	50	21
1042	SHCS 3/8"-16 X 1 1/4"	each	50	15
1046	HHCS 3/8"-16 X 3/4" GR8	each	50	4
1047	HHCS 3/8"-16 X 1" GR8	each	50	6
1049	HHCS 3/8"-16 X 1 1/2" GR8	each	50	22
106	HHCS 1/4"-20 X 1 1/4" GR8	each	55	8
1060	HHCS 3/8"-16 X 2 1/2" GR8	each	51	6
1061	BUTTON HD CS 3/8"-16 X 3/4"	each	51	4
1085	HHCS 7/16"-14 X 1 3/4" GR8	each	51	1
1087	NYLOCK NUT 1/2"-13	each	51	4
110	HHCS 1/4"-20 X 2 1/4" GR8	each	57	4
1101	NUT 1/2"-13 GR8	each	51	1
1102	FLATWASHER 1/2" GR8	each	51	12

Pick List

KITBOLT-23 / BOLT KIT F/CLE9625DP

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
1103	LOCKWASHER 1/2" GR8	each	51	7
1104	ROLL PIN 3/8" X 2"	each	51	1
1106	SHCS 1/2"-13 X 1 1/4"	each	51	3
1107	SHCS 1/2"-13 X 1 3/4"	each	51	8
1111	HHCS 1/2"-13 X 1 1/4" GR8	each	51	11
1113	HHCS 1/2"-13 X 2 1/2" GR8	each	51	2
1118-A	JAM NUT 1/2"-13	each	51	2
1121	HHCS 1/2"-13 X 4" GR8	each	51	8
1123	ROLL PIN 7/16" X 2"	each		3
1151	5/8" LOCKWASHER GRADE 8	each	51	74
1152	HI COLLAR LOCKWASHER 5/8	each	51	2
1153	SHCS 5/8"-11 X 1"	each	51	4
1154	SHCS 5/8"-11 X 1 3/4"	each	51	10
1155	SHCS 5/8"-11 X 2"	each	51	2
1156	HHCS 5/8"-11 X 1 1/4" GR8	each	51	6
1157	HHCS 5/8"-11 X 1 1/2" GR8	each	51	22
1160	HHCS 5/8"-11 X 2" GR8	each	51	39
1167	NYLOCK NUT 3/4"-10	each	52	1
1176-B	NYLOCK NUT LO PRO 3/4"-16	each	52	1
1178	JAM NUT 7/8"-14	each	52	50
1224	LOCKWASHER 7/8" GR8 HEAVY SPLIT	each	52	50
1228	DOWEL PIN 5/8" X 1 1/2" DP154	each	53	2
1252B	COTTER PIN 1/8" X 1" SS	each	53	4
1257	DRIVE ZERT 1/4"	each	53	50
1274	SHCS 1"-8 X 7 1/4"	each		4
1276	SCREW, MACHINE 6-32 X 3/8" BRASS	each	54	4

Pick List

KITBOLT-23 / BOLT KIT F/CLE9625DP

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
1283	SHCS 7/8"-9 X 6 1/2"	each		4
1292	JAM NUT 1 1/2"-12	each	54	24
145	HHCS 3/8"-16 X 2 3/4" GR8	each	57	2
149	NUT 7/16"-14 GR8 REFER TO P/N 1080 OBSOLETE	each	55	1
151	FLATWASHER 7/16" GR8	each	55	1
166	LOCKWASHER 1/2" GR8 REFER TO P/N 1103 OBSOLETE	each	55	4
175	HHCS 1/2"-13 X 2 3/4" GR8	each	57	1
202	HHCS 5/8"-11 X 2 1/2" GR8	each	57	4
203	HHCS 5/8"-11 X 2 3/4" GR8	each	57	8
2069	HHCS 1/4"-20 X 6" GR8	each	M2-E	4
210	HI-COLLAR LOCKWASHER 1/2	each	56	8
212	NYLOCK NUT 1/4"-20 GR8	each	56	8
213	NYLOCK NUT 3/8"-16 GR8	each	56	2
246	SHCS 1/2"-13 X 1" GR8	each	56	8
248	SHCS 1/2"-13 X 1 1/2" REFER TO P/N 1106-A OBSOLETE	each	56	48
253	SHCS 1/2"-13 X 4"	each	56	8
254	SHCS 1/2"-13 X 4 1/2"	each		1
256	SHCS 5/8"-11 X 1 1/4"	each	56	6
257	SHCS 5/8"-11 X 1 1/2"	each	56	12

Pick List

KITBRG-23 / BEARING KIT F/CLE9625DP

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
00KITBRG23	PICKLIST FOR KITBRG-23 REV DATE: 01/27/03	each		1
08DU08	GARLOCK BUSHING 08DU08 1/2" ID X 1/2"	each	S2-F	4
1901	BEARING 306 SZZ	each	S5-D	2
1903	BEARING 306 SZZC	each	S5-D	2
1905	CLINCHER® IDLER BEARING X-tra Heavy Duty Sealed type MODIFIED MU5212TM BEARIN	each	S5-D	15
1915	5203SBKFF BEARING .693 ID x 1.5748 OD x .6875W static load rate: 2020 lbf	each	S5-E	1
1917	SEALED BEARING - NTN #6309	each	S5-E	4
1918	INNER RACE TORRINGTON IR-253020	each		60
1921	SNAP RING EXT. WSM-98	each	S5-E	1
1926	SNAP RING INT. RR-433 SPIROL LOC	each	S5-E	8
1938	SNAP RING EXT. RST-118	each	S5-E	1
1942-A	EXTERNAL SNAP RING ARTCO 1500-X74	each	S5-F	2
1948	SNAP RING INT. RRT-283	each	S5-F	2
1950	SNAP RING EXT. N5100-100	each	S5-F	2
1985	ROLLER BEARING MU5214TV VENDOR PART #	each	S5-G	3
2021	GARLOCK BUSHING 24DU16 1 1/2" ID X 1" DOOR BUSHING	each	S2-G	1
2046	GARLOCK BUSHING 08DU10 1/2" ID X 5/8" F/ REAR MNT.	each	S2-F	1
20DU16	GARLOCK BUSHING 20DU16 1 1/4" ID X 1"	each	S2-F	3
30DU36	GARLOCK BUSHING 30DU36 1 7/8" ID X 2 1/4"	each	S2-G	24
32DU16	GARLOCK BUSHING 32DU16 2" ID X 1 "	each	S2-G	2

27-Feb-03 9:56 AM

SUPERIOR MANUFACTURING

Pick List

KITBRG-23 / BEARING KIT F/CLE9625DP

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
72025	GARLOCK BUSHING 24DU24 1 1/2" ID X 1 1/2" F/ PIVOT PIN	each	S2-G	1 .	
82046	GARLOCK BUSHING 12DU10 3/4" ID X 5/8" F/ LINKAGE	each	S2-F	1 .	
SSCF1875	1 7/8" SEVERE SERVICE CAM FOLLOWER ASSEMBLY PICKLIST F/ CLE7625DP	each	M19-E	50	

Pick List

SLV1000-01 / N.C. SELF LUBRICATED VALVE

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
2-016	O RING-5/8"ID 3/4"OD 1/16"WIDTH	each		1	
40028	PROTECTOR SLEEVE F/ DOOR SWITCHES(SLV1000-01)	each	3-B	1	
MA10-ACNC-04	2 WAY CAM OPERATED VALVE	each	35-B	1	
SLV1002	N.C SPOOL F/ SLV1000-01	each		1	
SLV1003	DOOR SWITCH VALVE ROLLER F/ SLV1000	each		1	

13-Jun-01 11:30 AM

SUPERIOR MANUFACTURING

Pick List

SSCF1875 / 1 7/8" SEVERE SERVICE CAM

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00SSCF1875	PICKLIST FOR SSCF1875 REV DATE: 09/08/99 SEE NOTES F/SSCF1875	each		1	
1178	JAM NUT 7/8"-14	each		1	
1224	LOCKWASHER 7/8" GR8 HEAVY SPLIT	each		1	
1257	DRIVE ZERT 1/4"	each		1	
73007	CAM FOLLOWER RACE F/ CLE7625DP	each		1	
73008	CAM FOLLOWER STUD F/ CLE7625DP	each		1	
73009	FLANGE BUSHING 20FDU16 F/ CLE7625DP	each		1	

Pick List

CJDT9663 / 9 5/8 X 6 3/8 DOVETAIL JAW SET

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CJDT9663	PICKLIST FOR CJDT9663 REV DATE: 08/15/01	each		1	
1121	HHCS 1/2"-13 X 4"	each		8	
1301	BUTTON HEAD SCREW 1/2"-13 X 1" GR8	each		8	
82066	JAW PIN F/CLE9625DP TONG	each		2	
82067	JAW ROLLER F/CLE9625DP TONG	each		2	
82111	DIE CLIP F/ 9 5/8 DOVETAIL JAWS	each		8	
82120	9 5/8 X 6 3/8 DOVETAIL JAW	each		2	

15-Aug-01 11:45 AM

SUPERIOR MANUFACTURING

Pick List

CJDT9672 / 9 5/8 X 7 1/4 DOVETAIL JAW SET

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CJDT9672	PICKLIST FOR CJDT9672 REV DATE: 08/15/01	each		1	
1121	HHCS 1/2"-13 X 4"	each		8	
1301	BUTTON HEAD SCREW 1/2"-13 X 1" GR8	each		8	
82066	JAW PIN F/CLE9625DP TONG	each		2	
82067	JAW ROLLER F/CLE9625DP TONG	each		2	
82081	9 5/8 x 7 1/4 DOVETAIL JAW F/CLE9625DP JAW	each		2	
82111	DIE CLIP F/ 9 5/8 DOVETAIL JAWS	each		8	

Pick List

CJDT9675 / 9 5/8 X 7 1/2 DOVETAIL JAW SET

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CJDT9675	PICKLIST FOR CJDT9675 REV DATE: 08/15/01	each		1	
1121	HHCS 1/2"-13 X 4"	each		8	
1301	BUTTON HEAD SCREW 1/2"-13 X 1" GR8	each		8	
82066	JAW PIN F/CLE9625DP TONG	each		2	
82067	JAW ROLLER F/CLE9625DP TONG	each		2	
82094	9 5/8 x 7 1/2 DOVETAIL JAW F/CLE9625DP TONG	each		2	
82111	DIE CLIP F/ 9 5/8 DOVETAIL JAWS	each		8	

15-Aug-01 12:51 PM

SUPERIOR MANUFACTURING

Pick List

CJDT9680 / 9 5/8 X 8 DOVETAIL JAW SET

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CJDT9680	PICKLIST FOR CJDT9680 REV DATE: 08/15/01	each		1	
1121	HHCS 1/2"-13 X 4"	each		8	
1301	BUTTON HEAD SCREW 1/2"-13 X 1" GR8	each		8	
82066	JAW PIN F/CLE9625DP TONG	each		2	
82067	JAW ROLLER F/CLE9625DP TONG	each		2	
82093	9 5/8 x 8 DOVETAIL JAW F/CLE9625DP TONG	each		2	
82111	DIE CLIP F/ 9 5/8 DOVETAIL JAWS	each		8	

Pick List

CJDT9685 / 9 5/8 X 8 1/2 DOVETAIL JAW SET

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CJDT9685	PICKLIST FOR CJDT9685 REV DATE: 08/15/01	each		1	
1115	SHCS 1/2"-13 X 5 1/2" GR8	each		8	
1118-A	JAM NUT 1/2"-13	each		8	
82066	JAW PIN F/CLE9625DP TONG	each		2	
82067	JAW ROLLER F/CLE9625DP TONG	each		2	
82092	9 5/8 x 8 1/2 DOVETAIL JAW F/CLE9625DP TONG	each		2	
82111	DIE CLIP F/ 9 5/8 DOVETAIL JAWS	each		8	

15-Aug-01 1:07 PM

SUPERIOR MANUFACTURING

Pick List

CJDT9691 / 9 5/8 X 9 1/8 DOVETAIL JAW SET

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CJDT9691	PICKLIST FOR CJDT9691 REV DATE: 08/15/01	each		1	
1115	SHCS 1/2"-13 X 5 1/2" GR8	each		8	
1118-A	JAM NUT 1/2"-13	each		8	
82066	JAW PIN F/CLE9625DP TONG	each		2	
82067	JAW ROLLER F/CLE9625DP TONG	each		2	
82091	9 5/8 x 9 1/8 DOVETAIL JAW F/CLE9625DP TONG	each		2	
82111	DIE CLIP F/ 9 5/8 DOVETAIL JAWS	each		8	

15-Aug-01 1:14 PM

SUPERIOR MANUFACTURING

Pick List

CJDT9696 / 9 5/8 X 9 5/8 DOVETAIL JAW SET

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CJDT9696	PICKLIST FOR CJDT9696 REV DATE: 08/15/01	each		1	
1115	SHCS 1/2"-13 X 5 1/2" GR8	each		8	
1118-A	JAM NUT 1/2"-13	each		8	
82066	JAW PIN F/CLE9625DP TONG	each		2	
82067	JAW ROLLER F/CLE9625DP TONG	each		2	
82068	9 5/8 x 9 5/8 DOVETAIL JAW F/CLE9625DP TONG	each		2	
82111	DIE CLIP F/ 9 5/8 DOVETAIL JAWS	each		8	

Pick List

CJ-9686 / 9 5/8 X 8 5/8 SPLINED JAW SET

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CJ9686	PICKLIST FOR CJ-9686 REV DATE: 07/02/01	each		1.	
1115	SHCS 1/2"-13 X 5 1/2" GR8	each		8 .	
236	SHCS 3/8"-16 X 1"	each	1041	16	
82050	TONG JAW 9 5/8 x 8 5/8 SPLINED F/CLE9625DP TONG	each		2 .	
82066	JAW PIN F/CLE9625DP TONG	each		2 .	
82067	JAW ROLLER F/CLE9625DP TONG	each		2	
82070	JAW CLIP F/82069 JAW	each		8 .	

15-Aug-01 3:19 PM

SUPERIOR MANUFACTURING

Pick List

CJ-LF9655 / 9 5/8 X 5 1/2 LF JAW SET

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00CJLF9655	PICKLIST FOR CJ-LF9655 REV DATE: 08/15/01	each		1 _	
1121	HHCS 1/2"-13 X 4"	each		8 _	
236	SHCS 3/8"-16 X 1"	each	1041	8 _	
82069	9 5/8 x 5 1/2 LOW FRIC. JAW F/CLE9625DP TONG	each		2 _	
82071	LOW FRIC, JAW ROLLER F/82069 JAW	each		2 _	
82072	LOW FRIC. JAW PIN F/JAW 82069	each		2 _	
82082	GARLOCK 40DU32 F/82071 JAW ROLLER	each		8 _	
BUC5520	TOP RET.CLIP F/5 1/2 B.U. USE F/ TOP & BOTTOM	each	9-A	8 _	



SECTION 7 PARTS LISTS TABLE OF CONTENTS

SECTION 7B BUCDP9625 LOCKJAWTM DRILL PIPE BACKUP PARTS LISTS

BUCDP9625 / 9 5/8" LOCKJAW™ DRILL PIPE BACKUP	7B - 3
BUCDP9605 / OUTSIDE DOOR ASSEMBLY	7B - 7
BUCDP9615 / INSIDE JAW ASSEMBLY	7B - 8
BUCDP9606 / CYLINDER ASSEMBLY	7B - 9
ASAP9625 / SEAL KIT FOR 9 5/8" DP BACKUP	7B - 10
BUCDP9640 / BACKUP HI-PSI CAM SWITCH	7B - 10
SLV1000-04 / N.C. ORIG SPOOL VALVE W/ VENT	7B - 10

Revision: 09/01 Page 7B - 1

GVPTPVOD V	
SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System	D 7D 2
Revision: 09/01	Page 7B - 2

Pick List

BUCDP9625 / 9 5/8 LJ DRILL PIPE BACKUP

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
00BUCDP9625	PICKLIST FOR 9 5/8 DP BACKUP REV DATE: 08/20/01	each		1
1001	ZERT 1/8" NPT	each		8
101	LOCKWASHER 1/4" GR8	each		2
108	HHCS 1/4"-20 X 1 3/4" GR8	each		2
116	HHCS 1/4"-20 X 4 1/2" GR8	each		2
117	NUT 5/16"-18 GR.8	each	1023-A	2
1171	LOCKWASHER 3/4" GR8	each		24
1176	HHCS 3/4"-10 X 3" GR8	each		24
1176-A	NUT COARSE 3/4" GR8	each		24
118	LOCKWASHER 5/16" GR8	each		2
1277	SHCS 3/4"-10 X 2 1/4" GR8	each		36
129	HHCS 5/16"-18 X 2 3/4" GR8	each	1023-B1	2
134	LOCKWASHER 3/8" GR8	each	1027	2
1369	JAM NUT 1 1/8"-12	each		6
1402	PIPE NIPPLE 3/8" X 3" SCH.80	each	36-B	1
142	HHCS 3/8"-16 X 2" GR8	each	1050	2
1449	STREET EL 1/4"	each	37-B	1
1450	STREET EL 3/8"	each	37-B	3
1451	STREET EL 1/2" FORGED	each	37-B	4
1456	HEX NIPPLE 1/4"	each	37-B	1
1472	ADAPTER 1/2"MNPT X 1/2"MJIC STRAIGHT	each	37-C	2
1486	REDUCER BUSHING 3/8" X 1/4"	each	37-C	5
1491	REDUCER BUSHING 1/2" X 3/8"	each	37-D	4
1495	REDUCER BUSHING 3/4" X 1/2"	each	37-D	2
1498	90 SWVL 1/4"MJIC X FJIC	each	37-D	2

Pick List

BUCDP9625 / 9 5/8 LJ DRILL PIPE BACKUP

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
1562	ADAPTER 1/4"MNPT X 1/4"MJIC STRAIGHT	each	37-D	2
1570	ADAPTER 3/8"MNPT X 3/8"MJIC STRAIGHT	each	37-E	2
1576	90 1/4"MNPT X 1/4"MJIC	each	37-E	4
1577-A	90 3/8"MNPT X MJIC FORGED	each	37-E	3
1580	90 3/8" F X FNPT	each	38-A	1
1595	RUN TEE 3/8"	each	38-b	5
1598	RUN TEE 1/2"	each	38-c	2
1610	FLUSH PLUG 3/4" NPT	each	38-D	1
1611	FLUSH PLUG 1" MNPT	each	38-D	4
1650	GAUGE 0-3000 BAC-3M-25	each	35-D	1
1800	PARKER FLOW CONTROL F600	each	39-A	2
1979	CFH-2-SB CAM. FOL	each	39-E	6
212	NYLOCK NUT 1/4"-20 GR8	each	WELD BOX	2
278	LOCKWASHER 1 1/8"	each		6
BUC5524-A	CART.F/ SUN CHECK VALVE CKEB LBN	each		1
BUC5524-B	PILOT OPER CHECK VAVLE-BCC ALUM BODY ONLY (3000 PSI)	each		1
BUCDP9605	OUTSIDE DOOR ASSEMBLY PICKLIST	each		1
BUCDP9606	CYLINDER ASSEMBLY PICKLIST	each		1
BUCDP9608	CYLINDER GUIDE	each		4
BUCDP9615	INSIDE DOOR ASSEMBLY PICKLIST	each		1
BUCDP9617	OUTSIDE DOOR WEDGE	each		1
BUCDP9618	DOOR PIVOT BUSHING	each		2

Pick List

BUCDP9625 / 9 5/8 LJ DRILL PIPE BACKUP

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
BUCDP9619	INSIDE DOOR WEDGE	each		1 _	
BUCDP9621	BACKUP PIVOT PIN	each		2 .	
BUCDP9622	BACKUP SIDE PLATE	each		2 .	
BUCDP9640	BACKUP HI-PSI CAM SWITCH VALVE ASSEMBLY PICKLIST	each		1 _	
BUCDP9648	BACKUP SPACER	each		4 _	
BUCDP9652	BOTTOM PLATE WELDMENT PICKLIST	each		1 .	
BUCDP9653	TOP PLATE WELDMENT PICKLIST	each		1 _	
BUCI5514	DANFOSS VALVE BODY MATE W/158G5054 VALVE 158G2199 (BODY)	each	9-C	1 _	
BUCI7602-S11	VALVE BRACKET 7 5/8 TENSION STYLE B/U	each	25-D/W	1 .	
CM4565	LHA 1/4-NPT-CHECK VALVE CV02P5	each	31-C	2 .	
CM7654	PSI REDUCING VALVE (SUN) F/ CHROMEMASTERS YPDA-KAN-BB	each	32-D	1 _	
SMH1501-J	LEFT HAND TORSION SPRING 3.125 ID x .375 WIRE 50#/DEG	each		2 .	
SMH1501-K	RIGHT HAND TORSION SPRING 3.125 ID x .375 WIRE 50#/DEG	each		2 _	



Pick List

BUCDP9605 / OUTSIDE DOOR ASSEMBLY

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1001	ZERT 1/8" NPT	each		2 _	
1008	SET SCREW 1/4"-20 X 1"	each		2 _	
1042	SHCS 3/8"-16 X 1 1/4"	each	237	6 _	
1210	NUT 1"-8 GR8	each		1 _	
1218	1" LOCKWASHER GR8	each		1 _	
1315	HHCS 1"-8 X 8 1/2" GR.8	each		1 _	
1316	HHCS 1"-8 X 10 1/2" GR8	each		1 _	
36DU32	GARLOCK BUSHING	each		2 _	
48DU40	GARLOCK BUSHING	each		2 _	
48DU72	GARLOCK BUSHING	each		1 _	
BUCDP9603	TOP OUTSIDE DOOR PLATE	each		1 _	
BUCDP9607	BOTTOM OUTSIDE DOOR PLATE	each		1 _	
BUCDP9609	INSERT PIVOT PIN	each		1 _	
BUCDP9610	DOOR ROLLER	each		1 _	
BUCDP9611	DOOR ROLLER PIN	each		1 _	
BUCDP9620	DOOR INSERT	each		1 _	
BUCDP9634	CLIP	each		2 _	
BUCDP9637	DOOR SPACER	each		2 _	
BUCDP9638	DIE LOCK F/BUCDP9625	each		1 _	
BUCDP9651	PIVOTING INSERT SPRING	each		1 _	
BUCDP9654	INSERT SPRING SPACER	each		2 _	

Pick List

BUCDP9615 / INSIDE DOOR ASSEMBLY

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
1001	ZERT 1/8" NPT	each		2
1008	SET SCREW 1/4"-20 X 1"	each		2
1042	SHCS 3/8"-16 X 1 1/4"	each	237	6
1210	NUT 1"-8 GR8	each		1
1218	1" LOCKWASHER GR8	each		1
1315	HHCS 1"-8 X 8 1/2" GR.8	each		1
1316	HHCS 1"-8 X 10 1/2" GR8	each		1
36DU32	GARLOCK BUSHING	each		2
48DU40	GARLOCK BUSHING	each		2
48DU72	GARLOCK BUSHING	each		1
BUCDP9609	INSERT PIVOT PIN	each		1
BUCDP9610	DOOR ROLLER	each		1
BUCDP9611	DOOR ROLLER PIN	each		1
BUCDP9612	BOTTOM INSIDE DOOR PLATE	each		1
BUCDP9613	TOP INSIDE DOOR PLATE	each		1
BUCDP9620	DOOR INSERT	each		1
BUCDP9634	CLIP	each		2
BUCDP9637	DOOR SPACER	each		2
BUCDP9638	DIE LOCK F/BUCDP9625	each		1
BUCDP9651	PIVOTING INSERT SPRING	each		1
BUCDP9654	INSERT SPRING SPACER	each		2

Pick List

BUCDP9606 / CYLINDER ASSEMBLY

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
00BUCDP9606	PICKLIST FOR CYLINDER ASSY. REV DATE: 07/23/01	each		1	
1019	SET SCREW 1/4"-20 X 1/2"	each		2	
1042	SHCS 3/8"-16 X 1 1/4"	each	237	6	
1314	SHCS 1"-8 X 3" GR8	each		4	
1320	SHCS 3/4"-10 X 3" GR8	each		8	
ASAP9625	SEAL KIT FOR 9 5/8 DP BACKUP CYLINDER ASSEMBLY	each		1	
BUCDP9604	PISTON	each		1	
BUCDP9627	CYLINDER ROD WELDMENT PICK LIST	each		1	
BUCDP9632	CYLINDER	each		1	
BUCDP9633	CYLINDER INSERT	each		1	
BUCDP9634	CLIP	each		2	·
BUCDP9635	GLAND	each		1	
BUCDP9636	CYLINDER KEY F/BUCDP9625	each		1	
BUCDP9638	DIE LOCK F/BUCDP9625	each		1	
BUCDP9659	BACKKUP HI-PSI CAM PLATE	each		1	

Pick List

ASAP9625 / SEAL KIT FOR 9 5/8 DP BACKUP

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
25004250	POLYPACK 1/4" CROSS SECTION 4 1/4 X 4 3/4 X 1/4	each		1	
37506000	POLYPACK 3/8" CROSS SECTION 6 X 6 3/4 X 3/8	each		1	
37508250	POLYPACK 3/8" CROSS SECTION 8 1/4 X 9 X 3/8	each		1	
50008000	POLYPACK 1/2" CROSS SECTION 8 X 9 X 1/2	each		2	
H6000	ROD WIPER - URETHANE	each		1	
W2-62500750	WEAR BAND	each		1	

23-Jul-01 SUPERIOR MANUFACTURING

12:24 PM

Pick List

BUCDP9640 / BACKUP HI-PSI CAM SWITCH

Quantity to build: 1

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
10056	CAM SWITCH MTNG. BRACKET F/CLE1075-02 REMOTE TONG	each		1	
143	HHCS 3/8"-16 X 2 1/4" GR8	each	1055	4	
213	NYLOCK NUT 3/8"-16 GR8	each		4	
SLV1000-04	N.C. ORIG.SPOOL VALVE W/VENT NORMALLY CLOSED PICKLIST	each		1 .	

23-Jul-01 SUPERIOR MANUFACTURING

12:24 PM Pick List

SLV1000-04 / N.C. ORIG.SPOOL VALVE W/ VENT

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1579-B	VENT 1/8"NPT HUBER P/N MV001A	each	38-A	1 _	
40028	PROTECTOR SLEEVE F/ DOOR SWITCHES(SLV1000-01)	each	3-B	1 _	
MA10-ACNC-04	2 WAY CAM OPERATED VALVE	each	35-B	1 _	

SECTION 7 PARTS LISTS TABLE OF CONTENTS

SECTION 7C HYTOPS9625DP SUSPENSION SYSTEM PARTS LISTS

HTS9604 / VERTICAL CARRIAGE ASSEMBLY	7C - 3
SWC4250040A / SUPERIOR WELDED CYLINDER	7C - 4
HTS9605 / HORIZONTAL CARRIAGE ASSEMBLY	7C - 5
SWC4250040B / SUPERIOR WELDED CYLINDER	7C - 6
HTS9665 / TONG/BACKUP MOUNTING ASSEMBLY	7C - 7
HTS9634 / REAR SPRING ASSEMBLY	7C - 8
HTS9635 / FRONT SPRING ASSEMBLY	7C - 9
HTS9659 / PUSH CYLINDER ASSEMBLY	7C - 10

Revision: 09/01 Page 7C - 1



12-Dec-02 3:34 PM

SUPERIOR MANUFACTURING

Pick List

HTS9604 / VERTICAL CARRIAGE ASSEMBLY

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1001	ZERT 1/8" NPT	each	50	6 _	
1158	HHCS 5/8"-11 X 1 3/4" GR8	each	51	16 _	
1218	1" LOCKWASHER GR8	each	52	2 _	
194	NUT 5/8"-11 GR8	each	57	8 _	
195	LOCKWASHER 5/8" GR8 REFER TO P/N 1151 OBSOLETE	each	55	24 _	
2-232	O RING-2 3/4"ID 3"OD 1/8"WIDTH	each	O2-F	4 _	
202	HHCS 5/8"-11 X 2 1/2" GR8	each	57	8 _	
HTS15016	AXIAL BEARING Pacific Bearing-#984-063-AP6 F/ HYTOPS15000	each		4 _	
HTS9601	VERTICAL CARRIAGE WELDM PICKLIST	each		1 _	
HTS9601-S20	CAM VALVE MOUNTING PLAT HYTOPS9625	each		2 _	
HTS9606	HUB BUSHING F/SUSPENSION SYSTEM	each		1 _	
HTS9607	HUB SPACER F/SUSPENSION SYSTEM	each		1 _	
HTS9608	HUB OUTER SPACER F/SUSPENSION SYSTEM	each		1 _	
HTS9612	VERTICAL CARRIAGE PLUNG	each		2 _	
HTS9613	PLUNGER LOCK NUT	each		2 _	
HTS9614	PIVOT CYLINDER PIN	each		2 _	
SWC4250040A	SUPERIOR WELDED CYLINDE 4 BORE x 2 1/2 ROD x 40 STR. PICKLIST	each		2 _	

19-Jul-01 7:46 AM

SUPERIOR MANUFACTURING

Pick List

SWC4250040A / SUPERIOR WELDED CYLINDER

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1222	NUT 1 1/2"-12	each		1	
2-230	O RING-2 1/2"ID 2 3/4"OD 1/8"WIDTH	each		1	
2-342	O RING-3 5/8"ID 4"OD 3/16"WIDTH	each		1	
25002500-375	POLYPACK 1/4" CROSS SECTION 2 1/2 X 3 X 3/8	each		1	
8-342	BACK UP RING	each		1	
D2500	ROD WIPER 2 1/2"ID 3"OD 3/8"HGT. 1/4"BASE THK.	each		1	
DC4001-250	4"BORE x 2 1/2 ROD GLAND	each		1	
PS1800-64	HI PRESSURE SEAL	each		1	
RC-2518	CLEVIS	each		1	
SB40250-40A	CYLINDER BARREL F/4"B X 40"S CYLINDER	each		1	
SP40250	PISTON F/SUPERIOR WELDED CYLINDER 4"B X 30"S W/2 1/2"R	each		1	
SR402540	2 1/2"OD CYLINDER ROD F/4"B X 40"S CYL.	each		1	

12-Dec-02 3:44 PM

SUPERIOR MANUFACTURING

Pick List

HTS9605 / HORIZONTAL CARRIAGE ASSEMBLY

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1001	ZERT 1/8" NPT	each	50	4 _	
1158	HHCS 5/8"-11 X 1 3/4" GR8	each	51	16 _	
195	LOCKWASHER 5/8" GR8 REFER TO P/N 1151 OBSOLETE	each	55	24 _	
2-232	O RING-2 3/4"ID 3"OD 1/8"WIDTH	each	O2-F	4 _	
202	HHCS 5/8"-11 X 2 1/2" GR8	each	57	8 _	
HTS15016	AXIAL BEARING Pacific Bearing-#984-063-AP6 F/ HYTOPS15000	each		4 _	
HTS9602	CARRIAGE WELDMENT PICKLIST	each		1 _	
SWC4250040B	SUPERIOR WELDED CYLINDE 4 BORE x 2 1/2 ROD x 40 STR. PICKLIST	each		2 _	

19-Jul-01 11:29 AM

SUPERIOR MANUFACTURING

Pick List

SWC4250040B / SUPERIOR WELDED CYLINDER

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
1222	NUT 1 1/2"-12	each		1
2-230	O RING-2 1/2"ID 2 3/4"OD 1/8"WIDTH	each		1
2-342	O RING-3 5/8"ID 4"OD 3/16"WIDTH	each		1
25002500-375	POLYPACK 1/4" CROSS SECTION 2 1/2 X 3 X 3/8	each		1
8-342	BACK UP RING	each		1
D2500	ROD WIPER 2 1/2"ID 3"OD 3/8"HGT. 1/4"BASE THK.	each		1
DC4001-250	4"BORE x 2 1/2 ROD GLAND	each		1
PS1800-64	HI PRESSURE SEAL	each		1
RC-2518	CLEVIS	each		1
SB40250-40B	4"BORE CYLINDER WELDMENT (PORTS ON LONG SIDE) PICKLIST	each		1
SP40250	PISTON F/SUPERIOR WELDED CYLINDER 4"B X 30"S W/2 1/2"R	each		1
SR402540	2 1/2"OD CYLINDER ROD F/4"B X 40"S CYL.	each		1

Pick List

HTS9665 / TONG/BACKUP MOUNTING ASSM.

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
1001	ZERT 1/8" NPT	each		2 _	
1088	HHCS 3/4"-10 X 6" GR8	each		8 _	
1151	LOCKWASHER 5/8" GR8 (195)	each	195	18 _	
1157	HHCS 5/8"-11 X 1 1/2" GR8	each	198	18 _	
1167	NYLOCK NUT 3/4"-10	each		8 _	
1171	LOCKWASHER 3/4" GR8	each		16 _	
1173	HHCS 3/4"-10 X 1 3/4" GR8	each		16 _	
215	SHCS 1/4"-20 X 3/4"	each		16 _	
272	HEX NUT 3/4"-16	each		16 _	
294	NYLOCK NUT 5/8"-11	each	1156-A	8 _	
BUCDP9629	LEG WELDMENT PICKLIST	each		4 _	
BUCDP9630	ROTATING FRAME WELDMENT PICKLIST	each		1 _	
BUCDP9657	UPPER GUIDE PLATE	each		2 _	
BUCDP9658	WEAR PLATE	each		4 _	
HTS9634	REAR SPRING ASSEMBLY PICKLIST	each		2 _	
HTS9635	FRONT SPRING ASSEMBLY PICKLIST	each		2 _	
HTS9650	TONG HANGER RAILS PICKLIST	each		2 _	
HTS9659	PUSH CYLINDER ASSEMBLY PICKLIST	each		4 _	
HTS9666	BACKUP STOP	each		4 _	
HTS9690	TROLLEY ASSEMBLY FOR CLE9625DP TONG	each		1 _	
X2-25	HHCS 5/8"-11 X 5" GR8	each		8 _	

13-Jun-01 12:07 PM

SUPERIOR MANUFACTURING

Pick List

HTS9634 / REAR SPRING ASSEMBLY

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
BUCDP9646	SPRING UPPER PLATE	each		1	
HTS9639	SPRING TUBE WELDMENT PICKLIST	each		1	
HTS9641	SPRING ADJUSTMENT NUT	each		1	
HTS9647	REAR SPRING SPACER WELDMENT PICKLIST	each		1	
SMH1501-H	COMPRESSION SPRING 5.50 OD X 5/8" WIRE X 40L X 80R	each		1	

13-Jun-01 12:10 PM

SUPERIOR MANUFACTURING

Pick List

HTS9635 / FRONT SPRING ASSEMBLY

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
BUCDP9646	SPRING UPPER PLATE	each		1	
HTS9639	SPRING TUBE WELDMENT PICKLIST	each		1	
HTS9640	FRONT SPRING SPACER WELDMENT PICKLIST	each		1	
HTS9641	SPRING ADJUSTMENT NUT	each		1	
SMH1501-H	COMPRESSION SPRING 5.50 OD X 5/8" WIRE X 40L X 80R	each		1	

13-Jun-01 12:13 PM

SUPERIOR MANUFACTURING

Pick List

HTS9659 / PUSH CYLINDER ASSEMBLY

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
194	NUT 5/8"-11 GR8	each		2	
HTS9660	PNEUMATIC PUSH CYL. WELDMENT PICKLIST	each		1	
HTS9661	AIR CYLINDER ADJUSTMENT ROD	each		1	
HTS9662	AIR CYLINDER BOT. THRUST PL.	each		1	

Pick List

HTS9690 / TROLLEY ASSEMBLY

Part Number	Description	U/M	Bin/ Location	Quantity Quantity to Pull Pulled
1001	ZERT 1/8" NPT	each		2
1002	ZERT 90 DEG. 1/8" NPT	each		2
1009A	ROLL PIN 1/4" X 1 3/4"	each		1
1112	HHCS 1/2"-13 X 1 1/2" GR8	each	170	6
1176-A	NUT COARSE 3/4" GR8	each		4
1184	SHCS 3/4"-10 X 8 1/2" GR8	each		4
1319	FLATWASHER 1 1/4" GR8	each		1
1379	2" NPT PIPE CAP.	each	36-B	1
1910	SKF 1206 BEARING	each	39-B	8
1935	SNAP RING INT. RRN-300	each	39-B	2
1938	SNAP RING EXT. RST-118	each	39-C	4
CLEBU9630	CASTER WHEELS	each		4
CLEBU9635	ADJUSTMENT HANDLE WELDMENTS F/9 5/8 & 10 3/4 BUCKING UNI PICKLIST	each		1
CLEBU9650	ROD CLEVIS (RC-1712)	each	11-C	1
CLEBU9651	PIVOT PIN (CP-1345)	each	11-D	1
HTS9691	SPRING RETAINER FOR CLE9625DP TONG	each		8
HTS9693	SPRING RACK FOR CLE9625DP TONG	each		2
HTS9695	SPRING SPACER FOR CLE9625DP TONG	each		4
HTS9696	SPRING HOUSE WELDMENT FOR CLE9625DP TONG	each		1
HTS9697	FRONT SPRING HOUSE PLATE FOR CLE9625DP TONG	each		1
HTS9698	SPRING ADJUSTMENT ROD FOR CLE9625DP TONG	each		1
HTS9699	SPACER FOR CLE9625DP TONG	each		1

20-Jul-01 1:26 PM

SUPERIOR MANUFACTURING

Pick List

HTS9690 / TROLLEY ASSEMBLY

Part Number	Description	U/M	Bin/ Location	Quantity to Pull	Quantity Pulled
HTS9700	CENTURY SPRING (D-1466) FOR 1 1/2" HOLE & 3/4" ROD CLE9625DP TONG	each		8	
HTS9701	YOKE BEARING F/ CLE9625DP TONG	each		1	

ACCESSORIES AND OPTIONS

Several different accessory items are available for the **CLINCHER®** Tong to allow them to be customized to provide a system most appropriate for the inducer's application.

CLE9625DP Tong Accessories

Compression Load Cell and Torque Gauge directly measures applied torque
Tension Load Cell and Torque Gauge directly measures applied torque

Tong Handles with closed covers protects operators hands

Solenoid Operated Module for Dump Valve allows computer to limit torque applied

Adapter for Turns Proximity Switch allows computer to sense rotation

3 Point Lifting Bridle alternative lifting system
Lift Cylinder with Integral Spring Hanger controls vertical position

TSP-80 Tong Speed Control allows slow speed rotation with full torque

2 Speed Motors

Alternate Motor Displacements

Hydraulically Operated Cage Plate Brake System

BUCDP9625 Backup Accessories

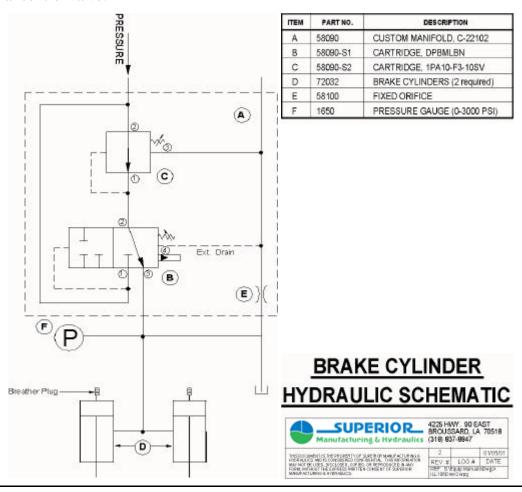
Backup Handles Simplifies manipulation

ACCESSORIES AND OPTIONS

Hydraulically Operated Cage Plate Brake System

This system replaces the springs used to energize the cage plate brake band. When the tong motor is activated, hydraulic pressure is directed through a pressure reducing valve (ref Item B, Dwg. No. Ill1080) set at 250 to 300 psi. This low pressure fluid is then directed through a directional control valve system (ref Item A) and on to a pair of hydraulic cylinders (ref Item C) connected to the brake band. This pressure creates the brake band resistance required to cause the relative rotation between the cage plate assembly and the ring gear required to activate the jaws. At high torques when the motor pressure exceeds approximately 2000 psi the directional control valve shifts to shut off hydraulic fluid into the brake cylinder. Pressure contained within the cylinders is allowed to bleed off through a fixed orifice (ref Item D) to a level equivalent to system back pressure. Relieving this pressure reduces brake friction at a time when it is not required because the jaws have already been actuated, thus increasing overall tong efficiency.

If brake performance appears to be less than required, pressure can be increased by adjusting the regulator stem on the pressure reducing valve (Item B). We do not recommend that brake system pressure be allowed to exceed 500 psi as shown on pressure gauge (Item E) attached to the directional control valve.



Revision: 07/01 Page 8 - 2

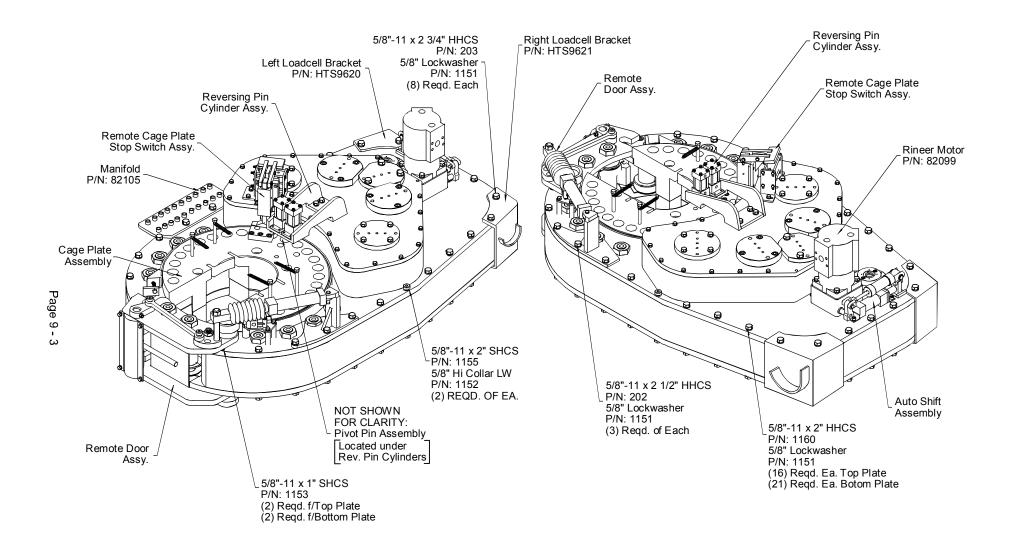
SECTION 9 9 5/8" XHT DP TONG ILLUSTRATIONS

TABLE OF CONTENTS

9 5/8" XHT DRILL PIPE TONG ASSEMBLY	9 - 3
UPPER HOUSING ASSEMBLY	9 - 4
9 5/8" XHT DP TONG GEAR TRAIN	9 - 4A
DUMBELL ROLLER ASSEMBLY	9 - 5
IDLER GEAR ASSEMBLY (4 Required)	9 - 6
CLUSTER GEAR ASSEMBLY	9 - 7
LOW PINION GEAR & ENCODER ASSEMBLY	9 - 8
SMART GEAR ASSEMBLY (2 Required)	9 - 9
REMOTE SHIFT ASSEMBLY	9 - 10
MOTOR ASSEMBLY (Sht. 1)	9 - 10A
MOTOR ASSEMBLY (Sht. 2)	9 - 10B
AUTOSHIFT ASSEMBLY	9 - 11
1 7/8" SEVERE SERVICE CAM FOLLOWER ASSEMBLY (Assy. No. SSCF1875)	9 - 12
TOP CAGE PLATE ASSEMBLY	9 - 13
REMOTE PIVOT PIN ASSEMBLY	9 - 14
REVERSING PIN CYLINDER ASSEMBLY	9 - 15
REMOTE CAGE PLATE STOP SWITCH ASSEMBLY	9 - 16
REMOTE TONG DOOR ASSEMBLY	9 - 17
SLV1000 SELF LUBRICATED VALVE (4 Required)	9 - 18
BRAKE BAND ASSEMBLY	9 - 19
9 5/8" XHT DP TONG DOVETAIL JAW ASSEMBLY (6 3/8", 7 1/4", 7 1/2", 8")	9 - 21
9 5/8" XHT DP TONG DOVETAIL JAW ASSEMBLY (8 1/2", 9 1/8", & 9 5/8")	9 - 22
9 5/8" XHT DP TONG SPLINED JAW ASSEMBLY (8 5/8")	9 - 23
9 5/8" XHT DP TONG LOW FRICTION JAW ASSEMBLY (5 1/2")	9 - 24
JAW SIZE CHART	9 - 25

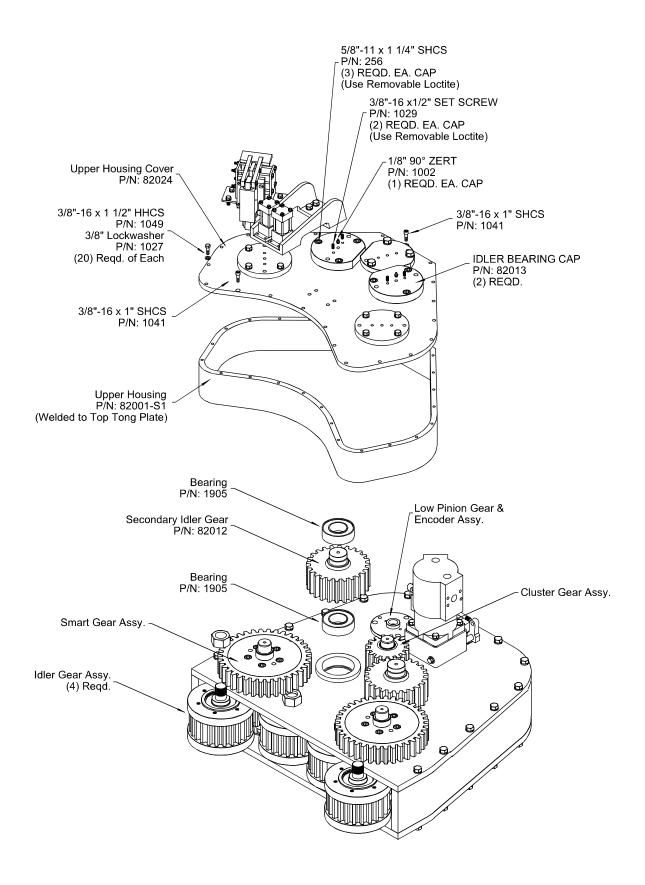
Revision: 03/03

SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System Revision: 03/03	Page 9 - 2



9 5/8" DRILL PIPE TONG ASSEMBLY





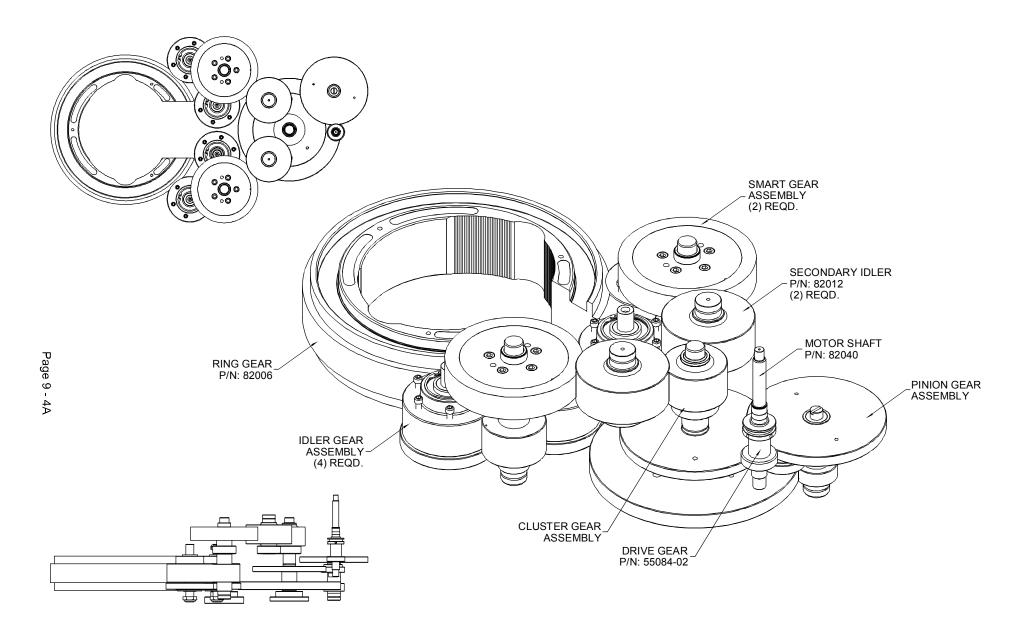
UPPER HOUSING ASSEMBLY



4225 HWY. 90 EAST BROUSSARD, LA 70518 (318) 837-8847

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REF: S:\ CLE9625	Equip Manual DP∖Housing.v	s\Dwgs\ /pg



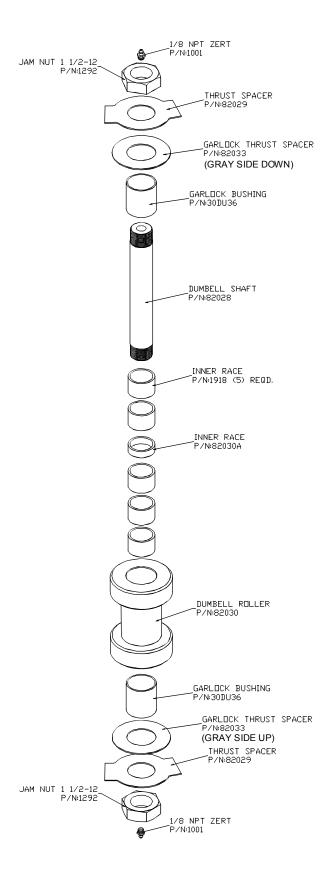
9 5/8" DRILL PIPE TONG GEAR TRAIN



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		02/28/03			
REV.#		DATE			
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DUMBELL ASSEMBLY

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PRODUCT BULLETIN

SUBJECT: INSTALLATION OF BEARING P/N 1905

DATE: March 12, 2003

BULLETIN No.: SPB03-03-12

REFERENCE: DWG. ILL1142 SHT. 1 & 2

Sheets 1 and 2 of Illustration 1142 demonstrates proper installation of Bearing P/N 1905. To avoid confusion when installing this Bearing which is used in several of our tools, please reference these illustrations.

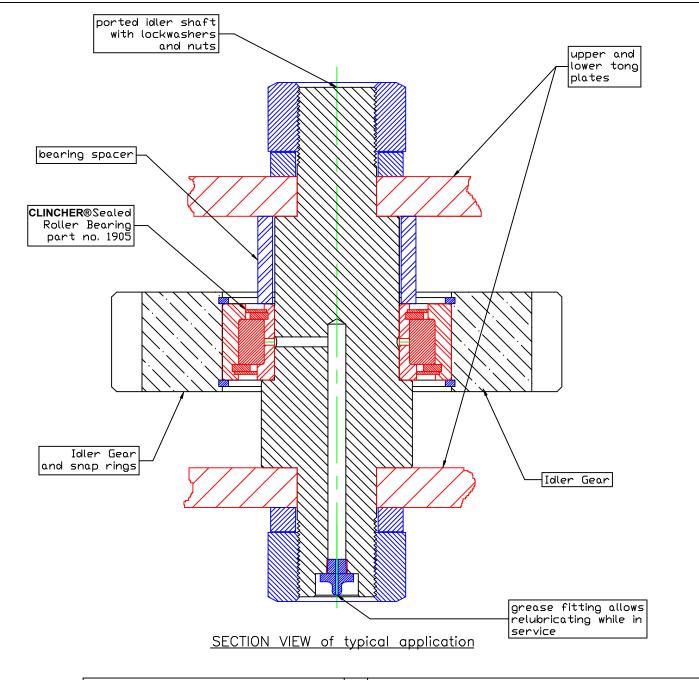
Features and Benefits:
Proprietary sealed bearing with full compliment roller design offers greater load ratings than commercially available sealed ball bearings. The ported inner race allows the bearing to be relubricated without disassembly. Integral elastomeric seals allow grease to be displaced but prevent migration of contaiminants into bearing.

Elastomeric seals are corrosion resistant and suitable for use in environments which are incompatible with traditional aluminum bearing shrouds.

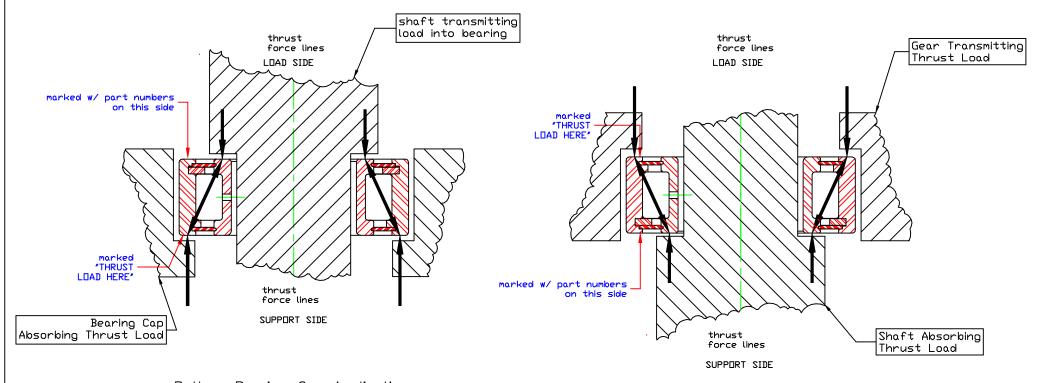
Unique geometric design allows rollers to absorb thrust loads to maximize component life.

Nominal OD: 4.3307 inches Nominal ID: 2.3622 inches Nominal Ht: 1.4375 inches static rating: 37540 lbs dynaminc rating: 29230 lbs (1mm cycles, 33 1/3 RPM f/ 500

hrs.)



					UNLESS OTHERWISE SPECIFIED TOLERANCES ARE 2 PLACE DEC. 3 PLACE DEC. FRACTIONS ANGLES SURFACE FLATNESS AR PL ±.020 ±.005 ± 1/16 ± .5' 280" ± .015 per fool		PERIOR 4225 HWY.90 E BROUSSARD,LA 70518 ring & Hydraulics (318)837-8847
3		1. Dimensions are in inches 2. Remove burns & sharp edges with 1/64x45'max. 3. Machined fillet radii are 1/32				PART NAME: SEALED IDLER BEA	
1	_	- 	added desc of thrust load capability		Normality,Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.	PART #: 1905	MATERIAL SPECIFICATION
Rev	.# By	Log#	Description of Revision		5. Machine diameters on a common centerline must be concentric within .005 T.I.R & unmachined diameters concentric within .032 T.I.	DRAWN BY:	Matl.Req:
		AND IS C DISCLOSE	UMENT IS THE PROPERTY OF SUPERIOR MANUFACTURING & HYDRAULICS ONSIDERED CONFIDENTIAL. THIS INFORMATION MAY NOT BE USED, D, COPIED, OR REPRODUCED IN ANY FORM, WITHOUT THE EXPRESS CONSENT OF SUPERIOR MANUFACTURING & HYDRAULICS.	1. =	$\frac{1}{1000}$ or $\frac{1}{1000}$ = Revision Number SHEET	APPROVED BY: CHK BY: DATE: REFILL1000/ILL1142.DWG	Initial Condition: Atternative Matt: H.T Instructions: Case Depth: C.D



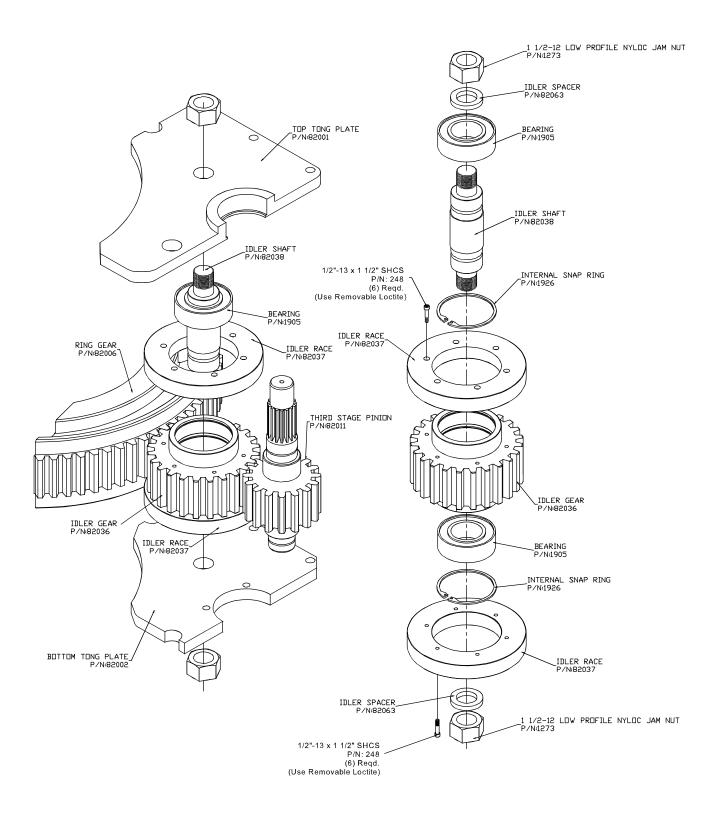
Bottom Bearing Cap Application

Gear Support Application

Installation instructions for **CLINCHER®** BEARING Part

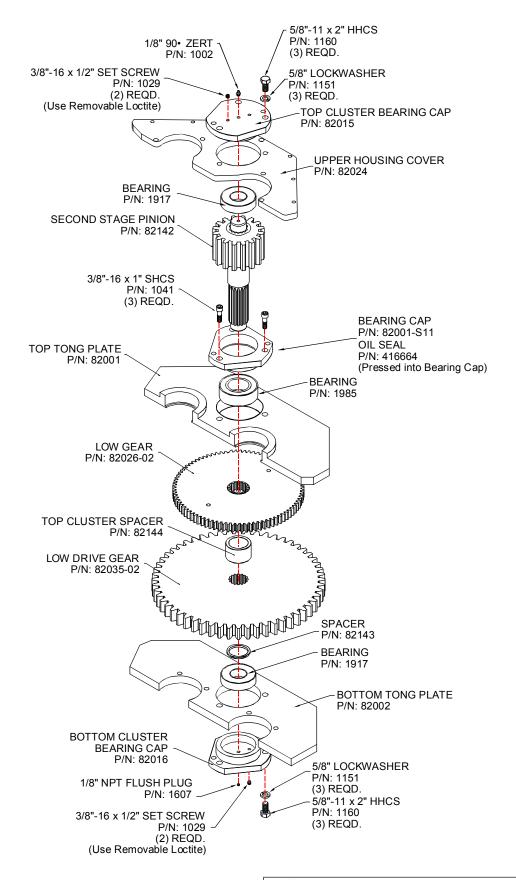
Number 1905

					UNLESS OTHERWISE SPECIFIED TOLERANCES ARE	R3		\SUF	PRIOR 4225 HWY.90 E
						FLATNESS AR PL. ± .015 per foot		4	BROUSSARD,LA 70518 ring & Hydraulics (318)837–8847
2				1. Dimensions are in inches 2. Remove burrs & sharp edges with 1/64x45'max. 3. Machined fillet radii are 1/32				llation instruct 1905 SEALED	ions for IDLER BEARING
1	DB	12/07/02	added desc of thrust load capability		4. Normality, Squareness & parallelism of machine surfaces are .002 per inch, to a max of .012 inches for a single surface.				MATERIAL SPECIFICATION
Rev.	# By	Log#	Description of Revision	_	5. Machine diameters on a common centerline must be within .005 T.I.R & unmachined diameters concentric	DRAWN BY:		Matl.Req:	
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	WRITTEN CONSENT OF SUPERIOR MANUFACTURING & HYDRAULICS.			1.000 = Critical Dimension 100% Inspection Required	2 of 2	REFILL1000/ILL1	142.DWG	H.T Instructions: Case Depth:	



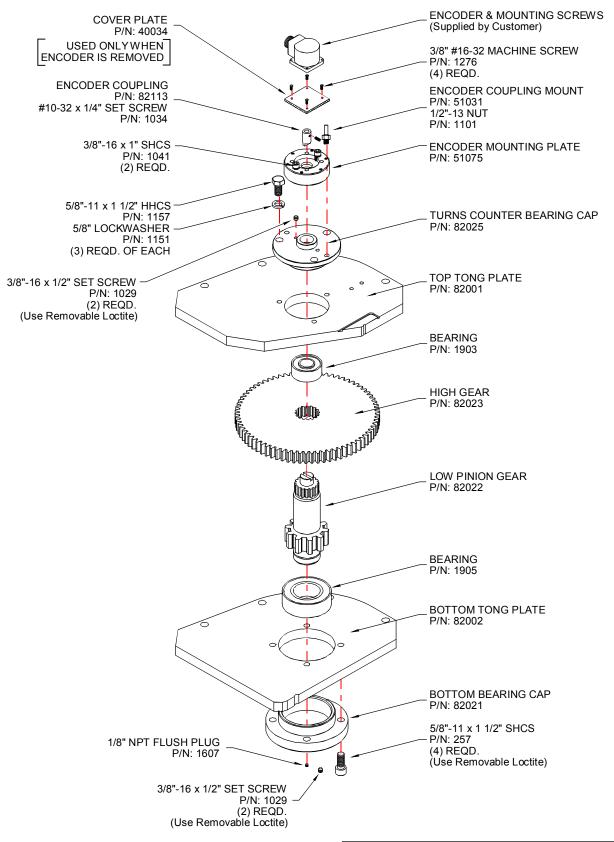
IDLER GEAR ASSEMBLY

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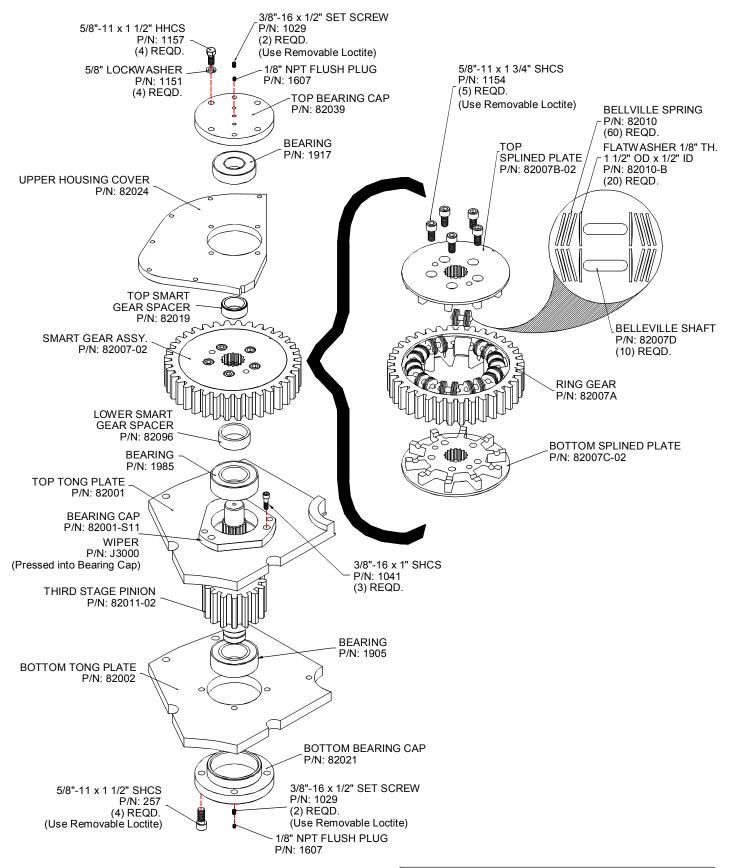
CLUSTER GEAR ASSEMBLY

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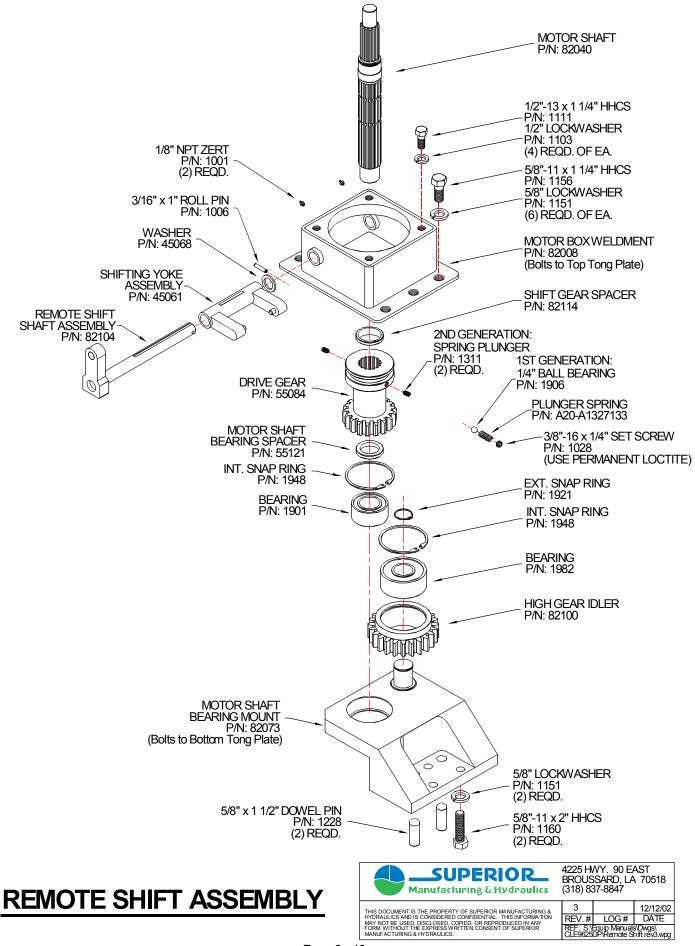
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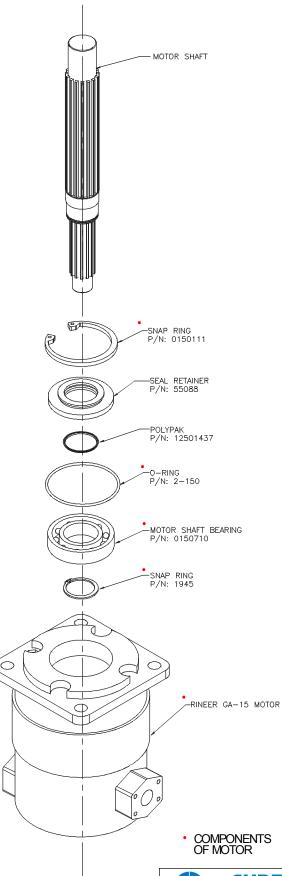
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SMART GEAR ASSEMBLY

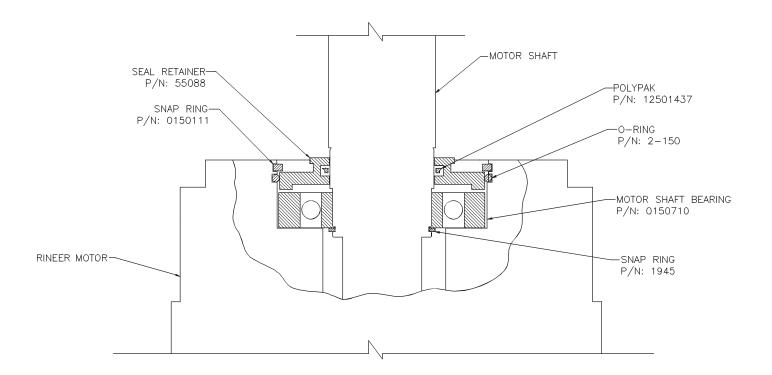


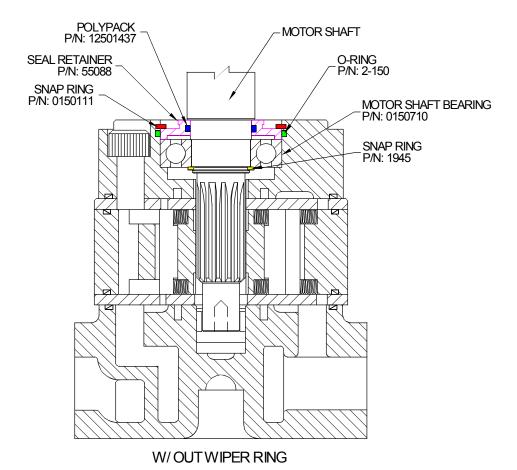




MOTOR ASSEMBLY

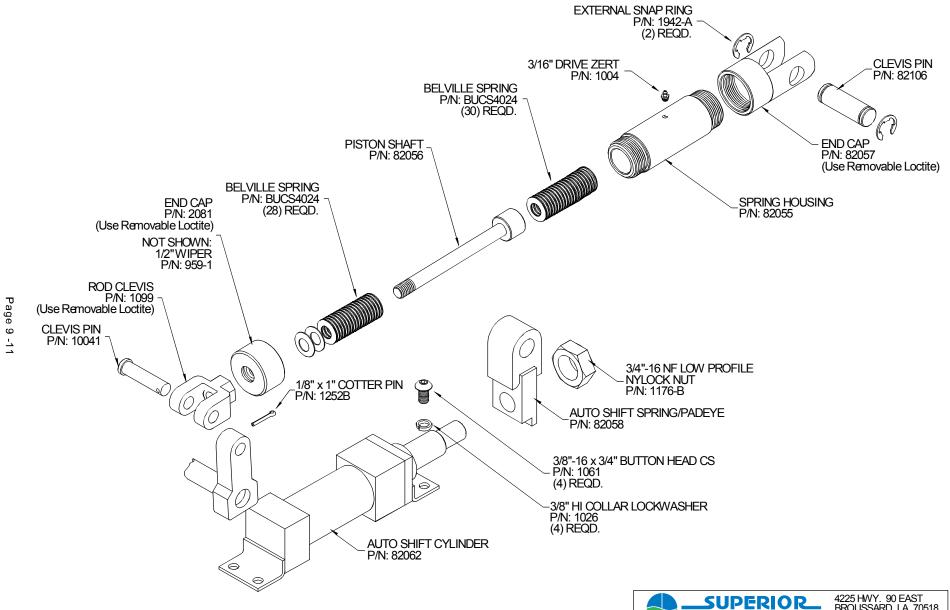
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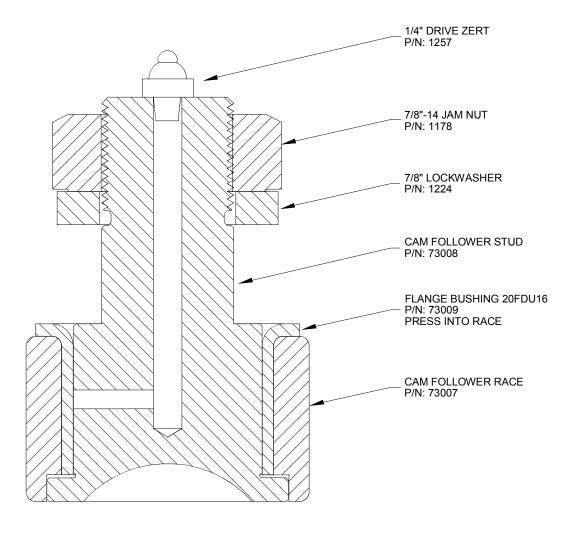
AUTOSHIFT ASSEMBLY



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SECTION VIEW

1 7/8" SEVERE SERVICE CAM FOLLOWER

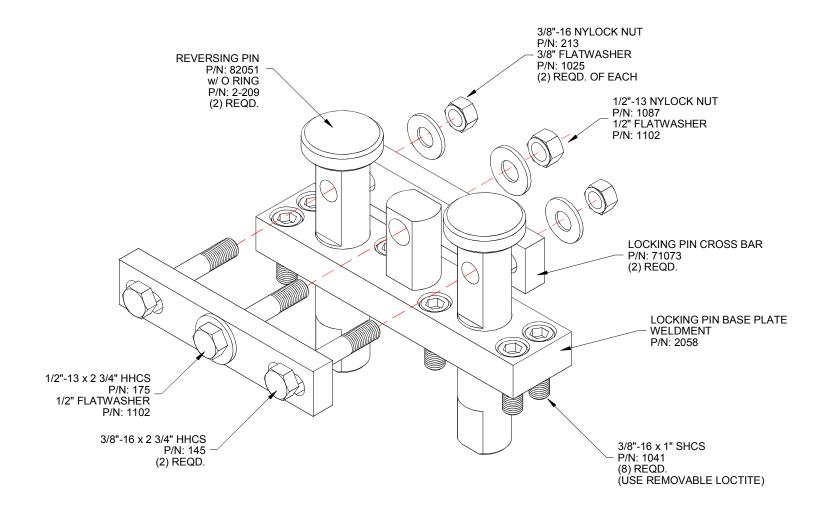
ASSEMBLY NUMBER SSCF1875



TOP CAGE PLATE ASSEMBLY



TYPICAL TOP & BOTTOM



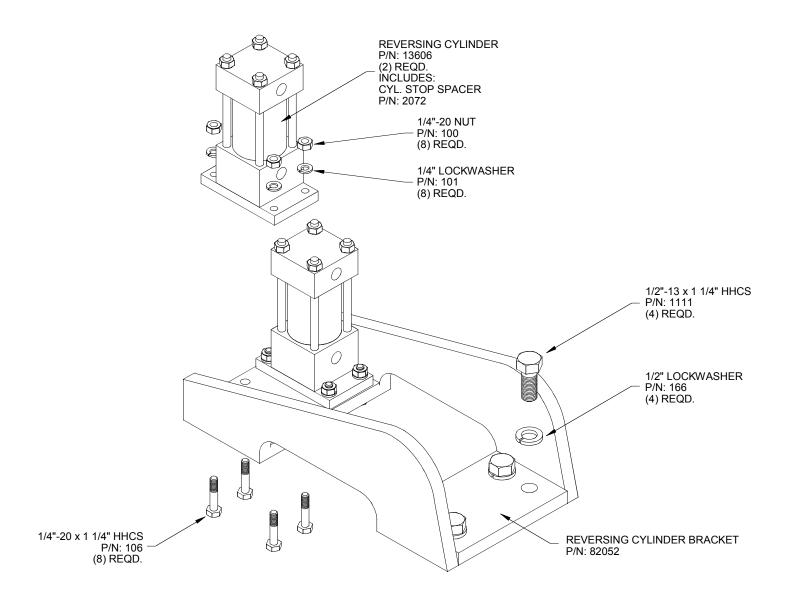
REMOTE PIVOT PIN ASSEMBLY



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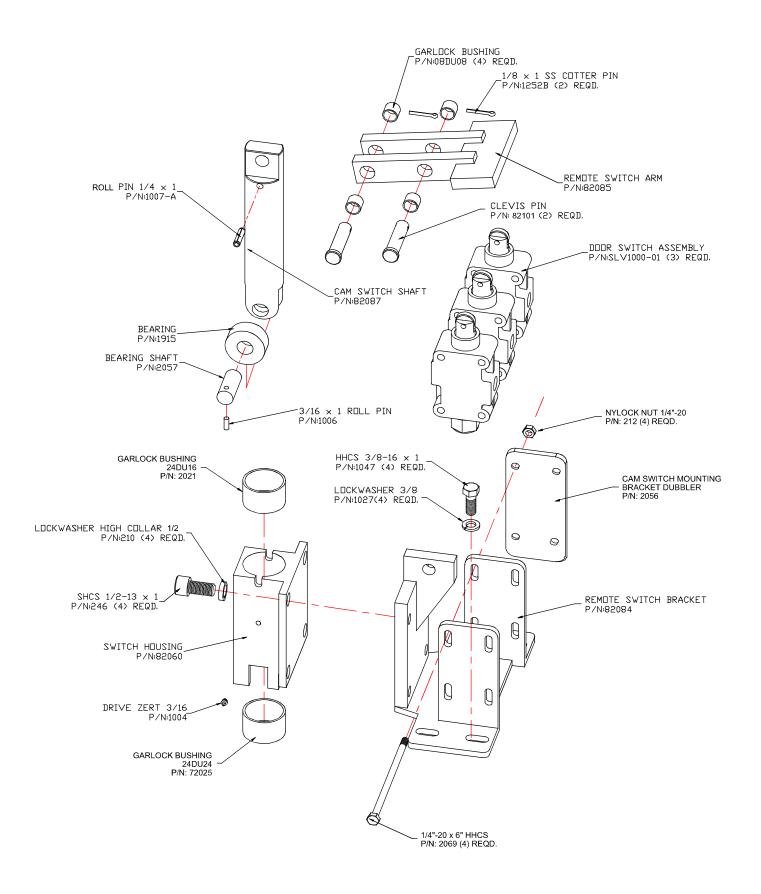
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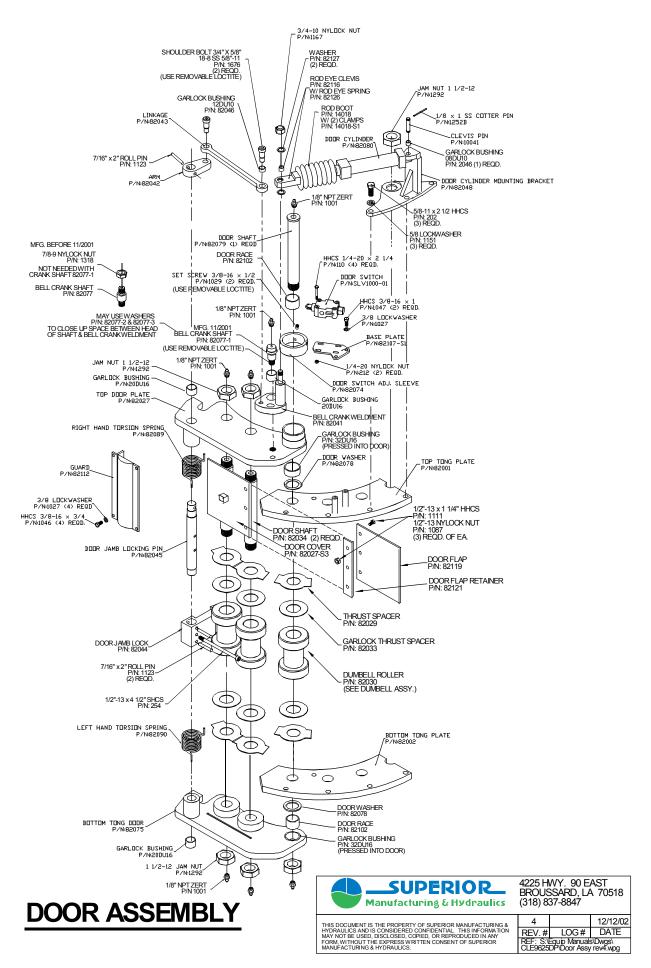
REVERSING PIN CYLINDER ASSEMBLY



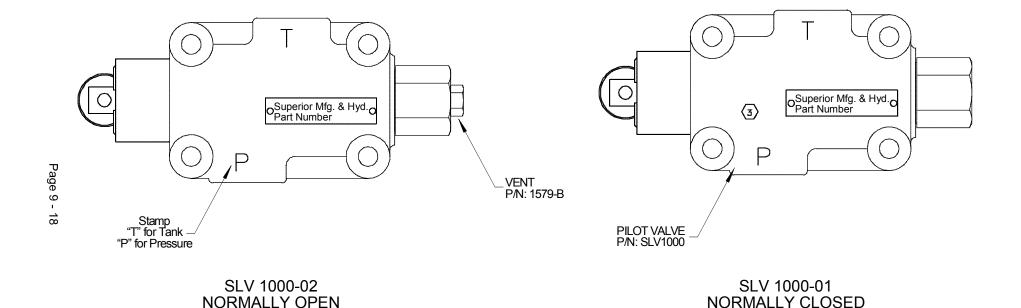


REMOTE CAGE PLATE STOP SWITCH ASSEMBLY



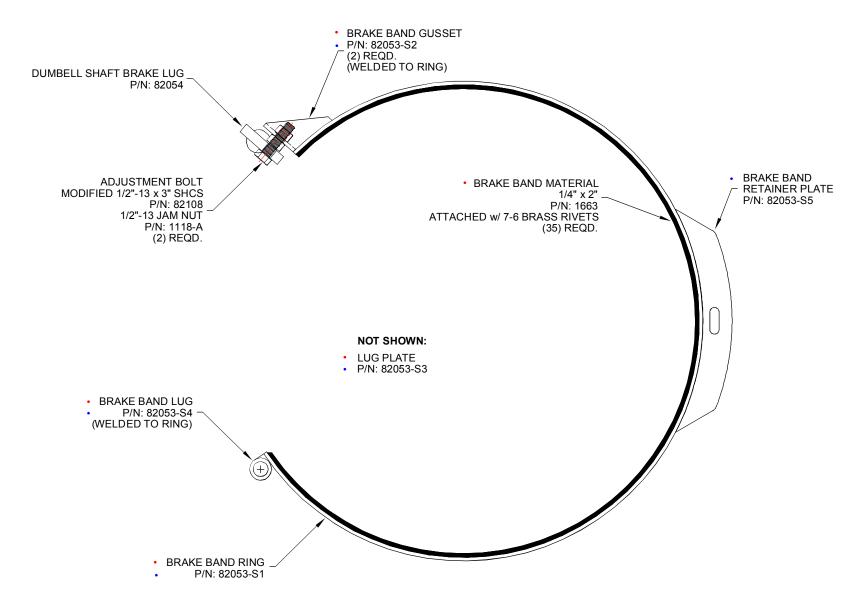


Page 9 - 17



SLV1000 SELF LUBRICATED VALVE

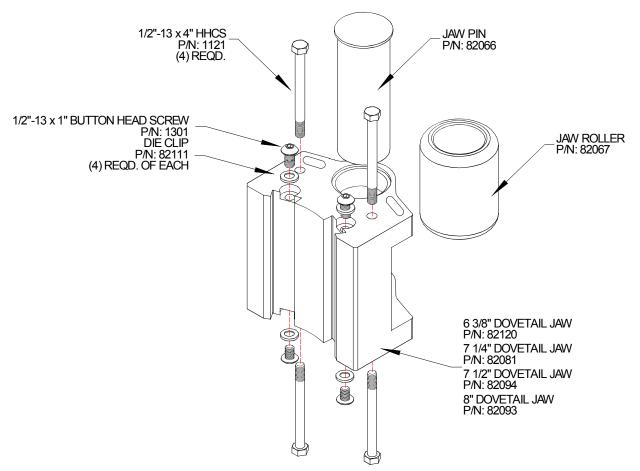




BRAKE BAND ASSEMBLY

TOP WELDMENT NUMBER 82053 · BOTTOM WELDMENT NUMBER 82128 ·



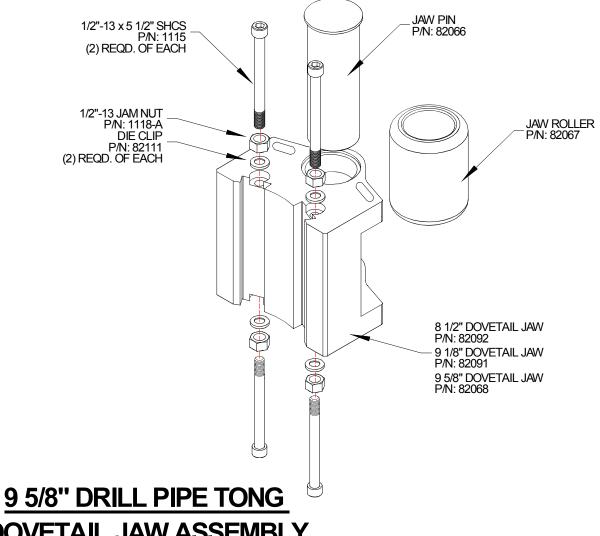


9 5/8" DRILL PIPE TONG **DOVETAIL JAW ASSEMBLY**

6 3/8" Assembly Number CJDT9663 7 1/4" Assembly Number CJDT9672 7 1/2" Assembly Number CJDT9675 8" Assembly Number CJDT9680

(2) Required (Right & Left Jaw are reversible and interchangeable)



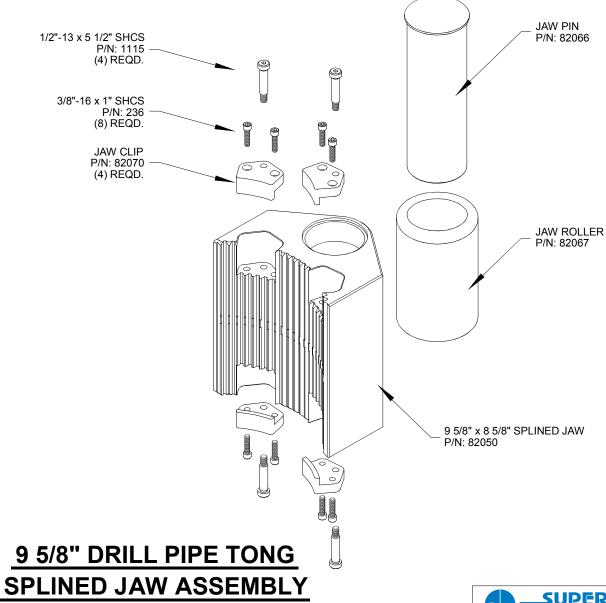


DOVETAIL JAW ASSEMBLY

8 1/2" Assembly Number CJDT9685 9 1/8" Assembly Number CJDT9691 9 5/8" Assembly Number CJDT9696

(2) Required (Right & Left Jaw are reversible and interchangeable)

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8 5/8" Assembly Number CJ-9686 (2) Required (Right & Left Jaw are reversible and interchangeable)

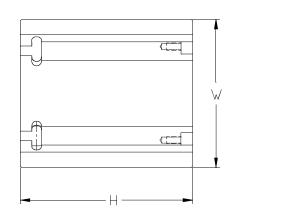


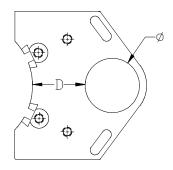
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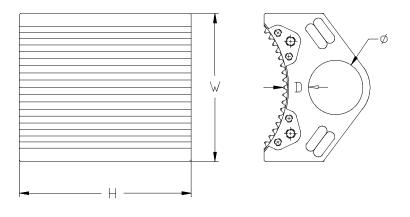
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CJ-LF-9655 LOW FRICTION JAW ASSEMBLY ILLUSTRATION PRESENTLY UNAVAILABLE WILL DISTRIBUTE WHEN PUBLISHED







DOVETAIL

SIZE	ASSY. NO.	JAW NO.	Ø	D	Н	W
9-5/8×6-3/8	CJDT9663	82120	2.823	2.753	8.975	7.724
9-5/8×7-1/4	CJDT9672	82081	2.823	2.346	8.975	7.724
9-5/8×7-1/2	CJDT9675	82094	2.823	2.221	8.975	7.724
9-5/8×8	CJDT9680	82093	2.823	1.971	8.975	7.724
9-5/8×8-1/2	CJDT9685	82092	2.823	1.722	8.975	7.724
9-5/8×9-1/8	CJDT9691	82091	2.823	1.409	8.975	7.724
9-5/8×9-5/8	CJDT9696	82068	2.823	1.159	8.975	7.724
9-5/8×8-5/8	CJ9686	82050	2.823	1.283	8.975	7.724
9-5/8×5-1/2	CJLF9655	82069	2.507	2.856	8.975	7.725

JAW SIZE CHART



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CLE9625DP\Jaw Size.wpg

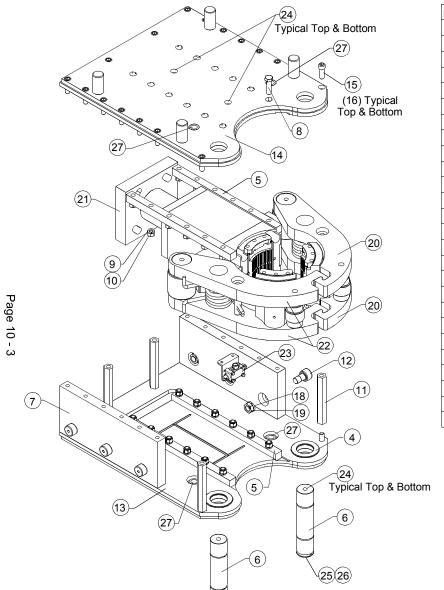
SECTION 10 9 5/8" LJ DP BACKUP ILLUSTRATIONS

TABLE OF CONTENTS

9 5/8" LOCKJAW™ DRILL PIPE BACKUP ASSEMBLY (1 of 3)	10 - 3
9 5/8" LOCKJAWTM DRILL PIPE BACKUP ASSEMBLY <i>(2 of 3)</i>	10 - 4
9 5/8" LOCKJAW[™] DRILL PIPE BACKUP ASSEMBLY <i>(3 of 3)</i>	10 - 5
CYLINDER ASSEMBLY (Assembly No. BUCDP9606)	10 - 6
OUTSIDE DOOR ASSEMBLY (Assembly No. BUCDP9605)	10 - 7
INSIDE DOOR ASSEMBLY (Assembly No. BUCDP969615)	10 - 8

Revision: 07/01 Page 10 - 1

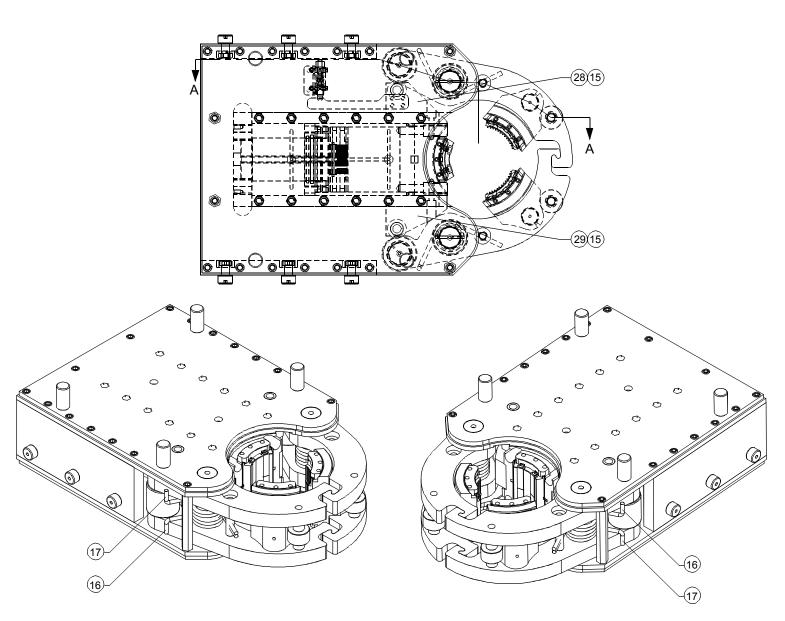
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SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System Revision: 07/01	Page 10 - 2



Item #	Qty.	Part Number	Description		
4	2	BUCDP9618	DOOR PIVOT BUSHING		
	4	BUC 5 P9608	CYLINDER GUIDE		
	2	BUC 6 P9621	BACKUP PIVOT PIN		
7	2	BUCDP9622	BACKUP SIDE PLATE		
8	24	1176	HHCS 3/4"-10 x 3"		
9	24	1171	LOCKWASHER 3/4"		
10	24	1176-A	HEX NUT 3/4"		
11	4	BUCDP9648	BACKUP SPACER		
12	6	1979	CFH-2-SB CAM FOLLOWER		
13	1	BUCDP9652	BOTTOM PLATE WELDMENT		
14	1	BUCDP9653	TOP PLATE WELDMENT		
15	36	1277	SHCS 3/4"-10 x 2 1/4"		
16	2	SMH1501-J	LEFT HAND TORSION SPRING 3.125 ID x .375 WIRE x 50 #/DEG.		
17	2	SMH1501-K	RIGHT HAND TORSION SPRING 3.125 ID x .375 WIRE x 50 #/DEG.		
18	6	278	LOCKWASHER 1 1/8"		
19	6	1369	JAM NUT 1 1/8"-12		
20	1	BUCDP9605	OUTSIDE DOOR ASSEMBLY		
21	1	BUCDP9606	CYLINDER ASSEMBLY		
22	1	BUCDP9615	INSIDE DOOR ASSEMBLY		
23	1	BUCDP9640	BACKUP HI-PSI CAM SWITCH		
24	8	1001	ZERT 1/8" NPT		
25	2	116	HHCS 1/4"-20 x 4 1/2"		
26	2	212	NYLOCK NUT 1/4"-20		
27	4	1611	FLUSH PLUG 1" MNPT		
28	1	BUCDP9617	OUTSIDE DOOR WEDGE		
29	1	BUCDP9619	INSIDE DOOR WEDGE		

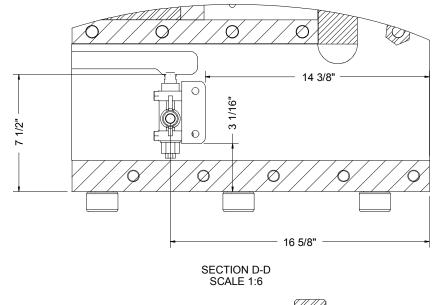
9 5/8" DRILL PIPE BACKUP ASSEMBLY

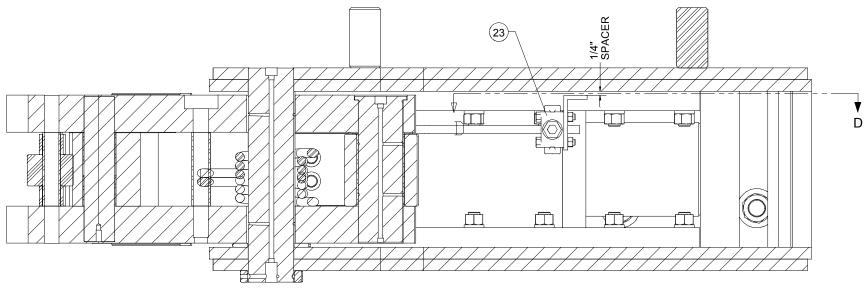




9 5/8" DRILL PIPE BACKUP ASSEMBLY







9 5/8" DRILL PIPE BACKUP ASSEMBLY



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NOT COMPONENTS OF CYLINDER ASSEMBLY

Item # Q1	ty. Part Number	Description	
	1 BUCDP9604	PISTON	
•	1 BUCDP9617	OUTSIDE DOOR WEDGE	
• 3	1 BUCDP9619	INSIDE DOOR WEDGE	
4	1 BUCDP9627	CYLINDER ROD WELDMENT	
	1 BUCDP9632	CYLINDER	
6	1 BUCDP9633	CYLINDER INSERT	
	2 BUCDP9634	CLIP	
	1 BUC&P9635	GLAND	4
9	1 BUCDP9636	CYLINDER KEY	
10	1 BUCDP9638	DIE LOCK	
11	1 BUCDP9659	BACKUP HI-PSI CAM PLATE	(16)
12	2 1019	SET SCREW 1/4"-20 x 1/2"	
13	6 1042	SHCS 3/8"-16 x 1 1/4"	
• 14	4 1277	SHCS 3/4"-10 x 2 1/4"	
15	4 1314	SHCS 1"-8 x 3"	
16	8 1320	SHCS 3/4"-10 x 3"	
17	1 ASAP9625	SEAL KIT	
14	3	5	8 17 SEAL KIT P/N: ASAP9625 WIPER
	15		P/N: H6000 POLYPAK P/N: 50008000 POLYPAK P/N: 37506000 WEAR BAND P/N: W2-6250075
	12	6	POLYPAK P/N: 25004250

CYLINDER ASSEMBLY

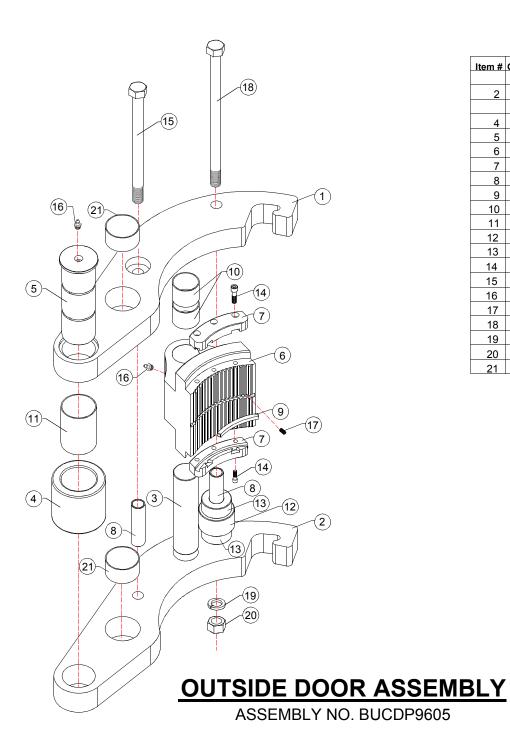
ASSEMBLY NO. BUCDP9606



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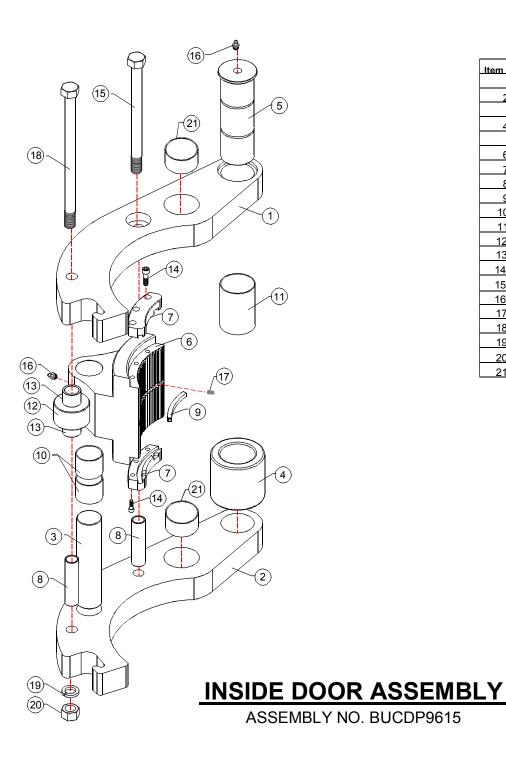
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BUCDP9625\BUCDP9606.wpg



Item #	Qty.	Part Number	Description
	-	BUCDP9603	TOP OUTSIDE DOOR PLATE
2	1	BUCDP9607	BOTTOM OUTSIDE DOOR PLATE
	1	BUC B P9609	INSERT PIVOT PIN
4	1	BUCDP9610	DOOR ROLLER
5	1	BUCDP9611	DOOR ROLLER PIN
6	1	BUCDP9620	DOOR INSERT
7	2	BUCDP9634	CLIP
8	2	BUCDP9637	DOOR SPACER
9	1	BUCDP9638	DIE LOCK
10	2	36DU32	GARLOCK BUSHING
11	1	48DU72	GARLOCK BUSHING
12	1	BUCDP9651	PIVOTING INSERT SPRING
13	2	BUCDP9654	INSERT SPRING SPACER
14	6	1042	SHCS 3/8"-16 x 1 1/4"
15	1	1315	HHCS 1"-8 x 8 1/2"
16	2	1001	ZERT 1/8" NPT
17	2	1008	SET SCREW 1/4"-20 x 1"
18	1	1316	HHCS 1"-8 x 10 1/2"
19	1	1218	LOCKWASHER 1"
20	1	1210	NUT 1"-8
21	2	48DU40	GARLOCK BUSHING







Item #	Qty.	Part Number	Description
	1	BUCDP9613	TOP INSIDE DOOR PLATE
2	1	BUCDP9612	BOTTOM INSIDE DOOR PLATE
	1	BUC B P9609	INSERT PIVOT PIN
4	1	BUCDP9610	DOOR ROLLER
	1	BUC B P9611	DOOR ROLLER PIN
6	1	BUCDP9620	DOOR INSERT
7	2	BUCDP9634	CLIP
8	2	BUCDP9637	DOOR SPACER
9	1	BUCDP9638	DIE LOCK
10	2	36DU32	GARLOCK BUSHING
11	1	48DU72	GARLOCK BUSHING
12	1	BUCDP9651	PIVOTING INSERT SPRING
13	2	BUCDP9654	INSERT SPRING SPACER
14	6	1042	SHCS 3/8"-16 x 1 1/4"
15	1	1315	HHCS 1"-8 x 8 1/2"
16	2	1001	ZERT 1/8" NPT
17	2	1008	SET SCREW 1/4"-20 x 1"
18	1	1316	HHCS 1"-8 x 10 1/2"
19	1	1218	LOCKWASHER 1"
20	1	1210	NUT 1"-8
21	2	48DU40	GARLOCK BUSHING



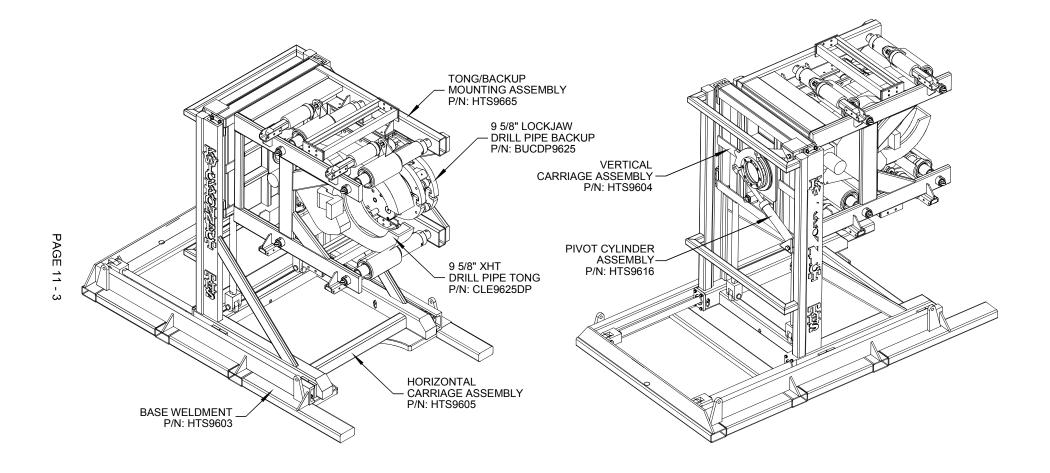
SECTION 11 9 5/8" HYTOPSTM POSITIONER SYSTEM ILLUSTRATIONS

TABLE OF CONTENTS

9 5/8" HYTOPSTM ASSEMBLY (Assy. No. HYTOPS9625DP)	11 - 3
VERTICAL CARRIAGE ASSEMBLY (Assy. No. HTS9604)	11 - 4
CYLINDER ASSEMBLY (2 Reqd.) (Assy. No. SWC4250040A)	11 - 5
HORIZONTAL CARRIAGE ASSEMBLY (Assy. No. HTS9605)	11 - 6
CYLINDER ASSEMBLY (2 Reqd.) (Assy. No. SWC4250040B)	11 - 7
PIVOT CYLINDER ASSEMBLY (Assy. No. HTS9616)	11 - 8
TONG/BACKUP MOUNTING ASSEMBLY (Assy. No. HTS9665)	11 - 9
REAR SPRING ASSEMBLY (2 Reqd.) (Assy. No. HTS9634)	11 - 10
FRONT SPRING ASSEMBLY (2 Reqd.) (Assy. No. HTS9635)	11 - 11
PUSH CYLINDER ASSEMBLY (4 Reqd.) (Assy. No. HTS9659)	11 - 12
TROLLEY ASSEMBLY (Assy. No. HTS9690)	11 - 13

Revision: 07/01 Page 11 - 1

SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System	
Revision: 07/01	Page 11 - 2



9 5/8" HYTOPS™ ASSEMBLY

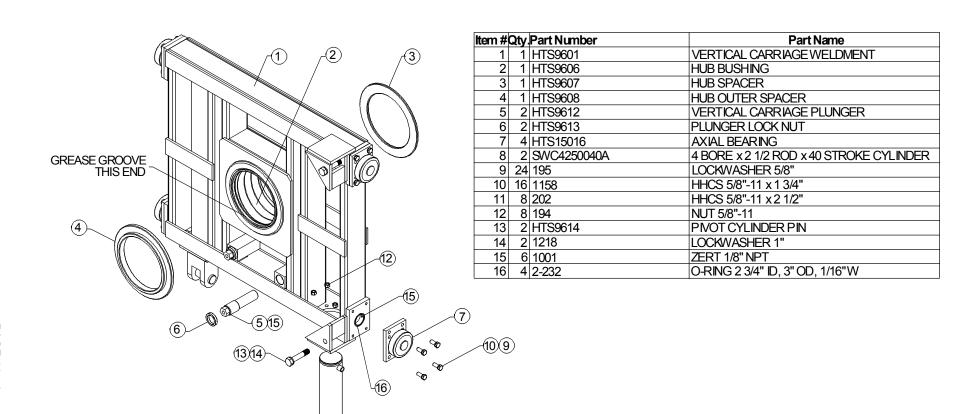
Assembly No. HYTOPS9625DP



4225 HWY. 90 EAST BROUSSARD, LA 70518 (318) 837-8847

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APPROX.WEIGHT (lbs.) = 1042.963

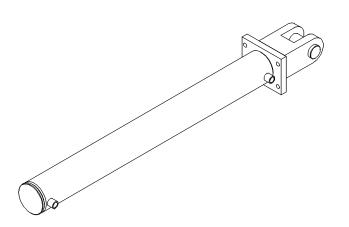
VERTICAL CARRIAGE ASSEMBLY

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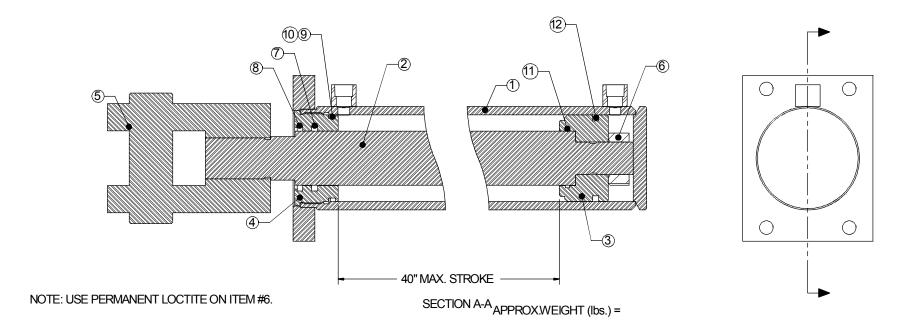
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ASSEMBLY NO. HTS9604



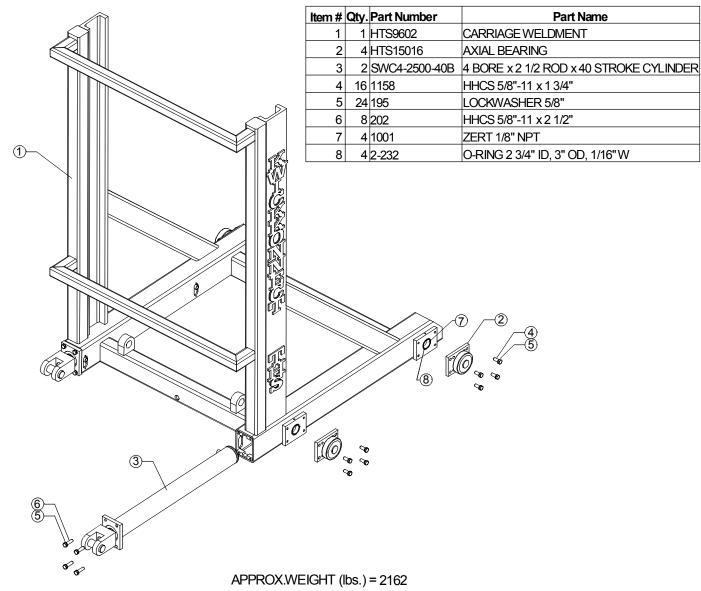


Item #	Qty.	Part Number	Part Name
1	1	SB40250-40A	4" BORE CYLINDER BARREL WELDMENT (PORTS ON SHORT SIDE)
2	1	SR402540	2 1/2 DIA. x 40 STROKE ROD
3	1	SP40250	4" PISTON
4	1	DC4001-250	4"BORE x 2 1/2 ROD GLAND
5	1	RC-2518	CLEVIS
6	1	1222	1 1/2"-12 NUT
7	1	25002500-375	POLYPAK 1/4" CROSS SECTION, 2 1/2 x 3 x 3/8
8	1	D2500	RODWIPER
9	1	2-342	O-RING 3 5/8" ID, 4" OD, 3/16" W
10	1	8-342	BACKUP RING
11	1	2-230	O-RING 2 1/2" ID, 2 3/4" OD, 1/8"W
12	1	PS1800-64	HIGH PRESSURE SEAL



CYLINDER ASSEMBLY ASSEMBLY NO. SWC4-2500-40A

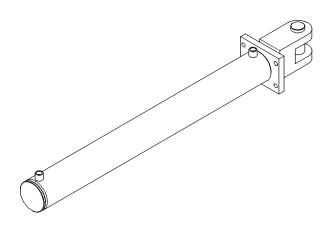




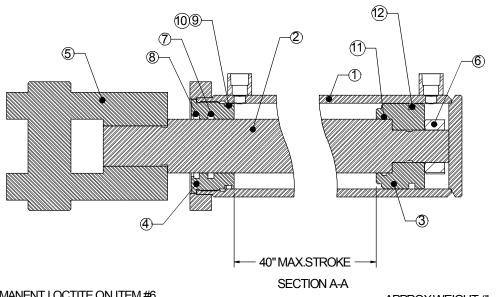
HORIZONTAL CARRIAGE ASSEMBLY

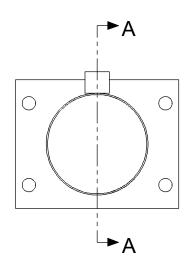
ASSEMBLY NO. HTS9605





Item #	Qty.	Part Number	Part Name	
1	1	SB40250-40B	4" BORE CYLINDER BARREL WELDMENT (PORTS ON LONG SIDE)	
2	1	SR402540	2 1/2 DIA. x 40 STROKE ROD	
3	1	SP40250	4" PISTON	
4	1	DC4001-250	4"BORE x 2 1/2 ROD GLAND	
5	1	RC-2518	CLEVIS	
6	1	1222	1 1/2"-12 NUT	
7	1	25002500-375	POLYPAK 1/4" CROSS SECTION, 2 1/2 x 3 x 3/8	
8	1	D2500	ROD WIPER	
9	1	2-342	O-RING 3 5/8" ID, 4" OD, 3/16" W	
10	1	8-342	BACKUP RING	
11	1	2-230	O-RING 2 1/2" ID, 2 3/4" OD, 1/8" W	
12	1	PS1800-64	HIGH PRESSURE SEAL	





NOTE: USE PERMANENT LOCTITE ON ITEM #6.

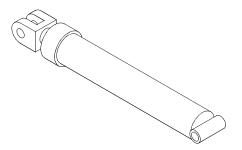
APPROX.WEIGHT (lbs.) = 180

CYLINDER ASSEMBLY

ASSEMBLY NO. SWC4-2500-40B



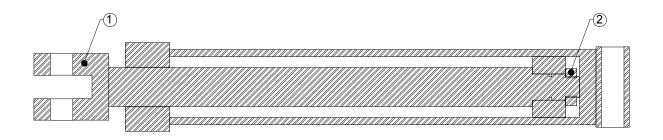
Item#	Qty.	Part Number	Part Name
1	1	HTS9615	PIVOT CYLINDER ROD WELDMENT
2	1	HTS9617	PIVOT CYLINDER NUT



	PISTON SEAL KIT				
Qty.	Parker Part Number	Description			
1	77-157	PISTON SEAL			
2	WR-500-50	WEAR RING			
1	130BN	O-RING			
1	150BN	O-RING			

GLAND SEAL KIT					
Qty.	Parker Part Number	Description			
1	U25-250-37B	POLYPAK			
1	ST-250	WIPER			
1	350BN	O-RING			
1	350UB	BACK UP			



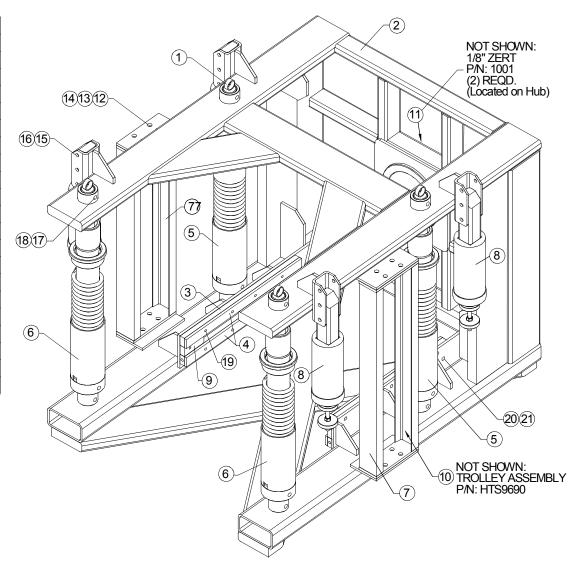


PIVOT CYLINDER ASSEMBLY

ASSEMBLY NUMBER: HTS9616

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FORM, WITHOUT THE EXPRESS WRITTEN CONSENT OF SUPERIOR MANUFACTURING & HYDRAULICS.		Equip Manual: 9625DP\HTS9	

Item #	Qtv.	Part Number	Part Name
1		BUCDP9629	LEG WELDMENT
2	1	BUCDP9630	ROTATING FRAME WELDMENT
3	2	BUCDP9657	UPPER GUIDE PLATE
4	4	BUCDP9658	WEAR PLATE
5	2	HTS9634	REAR SPRING ASSEMBLY
6	2	HTS9635	FRONT SPRING ASSEMBLY
7	2	HTS9650	TONG HANGER RAILS
8	4	HTS9659	PUSH CYLINDER ASSEMBLY
9	4	HTS9666	BACKUP STOP
10	1	HTS9690	TROLLEY ASSEMBLY
11	2	1001	ZERT 1/8" NPT
12	16	1173	HHCS 3/4"-10 x 1 3/4"
13	16	1171	3/4" LOCKWASHER
14	16	272	3/4"-16 HEX NUT
15	8	X2-25	5/8"-11 x 5" HHCS
16	8	294	5/8"-11 NYLOCK NUT
17	8	1088	3/4"-10 x 6" HHCS
18	8	1167	3/4"-10 NYLOCK NUT
19	16	215	1/4"-20 x 3/4" SHCS
20	18	1157	5/8"-11 x 1 1/2" HHCS
21	18	1151	5/8" LOCKWASHER

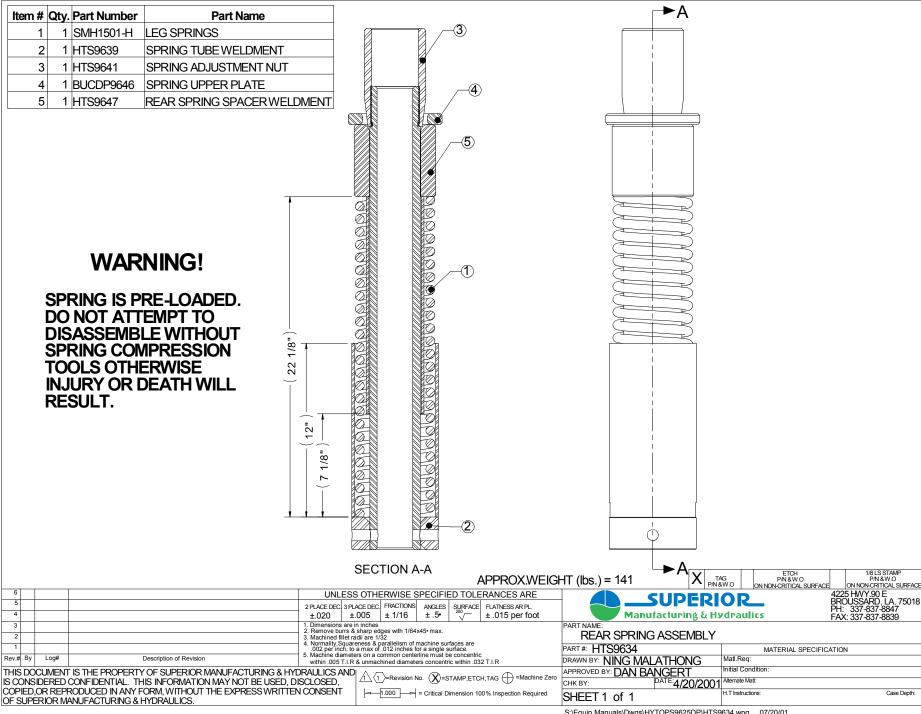


TONG / BACKUP MOUNTING ASSEMBLY

ASSEMBLY NUMBER: HTS9665

APPROX. WEIGHT (lbs.) = 3338.540





Rev.# By

Item #	Qty.	Part Number	Part Name
1	1	SMH1501-H	LEG SPRINGS
2	1	HTS9639	SPRING TUBE WELDMENT
3	1	HTS9640	FRONT SPRING SPACER WELDMENT
4	1	HTS9641	SPRING ADJUSTMENT NUT
5	1	BUCDP9646	SPRING UPPER PLATE

WARNING!

SPRING IS PRE-LOADED. DO NOT ATTEMPT TO **DISASSEMBLE WITHOUT SPRING COMPRESSION** TOOLS OTHERWISE INJURY OR DEATH WILL RESULT.

Description of Revision

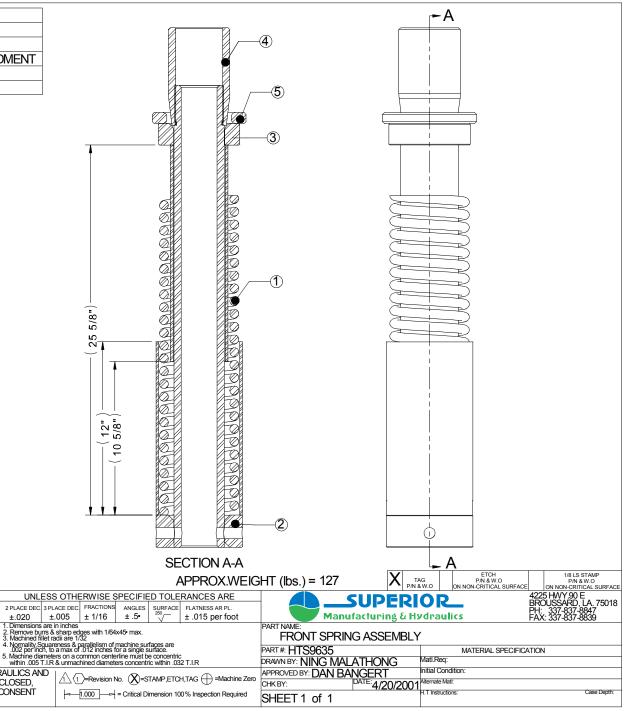
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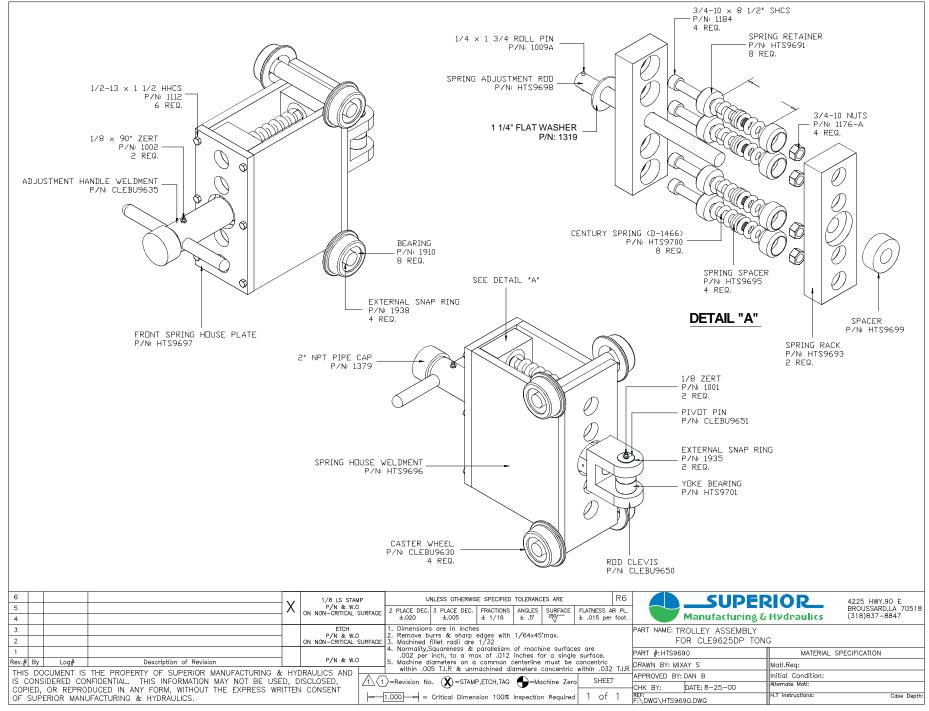
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	Item # Qty. Part Number	Part Name
	1 1 HTS9660	PNEUMATIC PUSH CYLINDER WELDMENT
	2 1 HTS9661	AIR CYLINDER ADJUSTMENT ROD
	3 1 HTS9662	AIR CYLINDER BOTTOM THRUST PLATE
	4 2 194	5/8"-11 NC NUT
3		TIPH 181SSTAMP
	APPROX.WEIGHT (lbs.) =	TAG PN&W.0 ON NON-CRITICAL SURFACE ON NON-CRITICAL SURFACE ON 1225 LIMAY ON E
UNLESS OTHERWISE SP 2 PLACE DEC 3 PLACE DEC FRACTIONS	APPROX.WEIGHT (lbs.) = PECIFIED TOLERANCES ARE ANGLES SURFACE FLATNESS ARPL.	TAG PN&W.O ON NON-CRITICAL SURFACE ON NON-CRITICAL SURFACE ON SOLVENTIAL SURFACE ON SOLV
UNLESS OTHERWISE SP 2PLACE DEC 3 PLACE DEC 18 PLACTONS + 1020 + 1015 + 1/16	APPROX.WEIGHT (lbs.) = PECIFIED TOLERANCES ARE ANGLES SUFFACE FLATINESS ARPL. ±.57 = 20 — ±.015 per foot	### 4225 HWY 90 E BROUSSARP, LA. 750: PH: 337-837-8839 Janufacturing & Hydraulics FAX: 337-837-8839
UNLESS OTHERWISE SP 2 PLACE DEC 3 PLACE DEC FRACTIONS ± 1/16 1. Dimensions are in inches 2 Remove Dums & sharp edges with 1/64v48	APPROX.WEIGHT (lbs.) = PECIFIED TOLERANCES ARE ANGLES SURFACE FLATNESS AR PL. ± .5 20 + 0.015 per foot FART NAME: PLISH C	### 4225 HWY 90 E BROUSSARD, LA. 750: PH: 337-837-837-839 YLINDER ASSEMBLY
UNLESS OTHERWISE SP 2 PLACE DEC 3 PLACE DEC FRACTIONS ± 020 ± 005 ± 1/16 1. Dimensions are in inches 2. Remove burs & sharp edges with 1/64v48	APPROX.WEIGHT (lbs.) = PECIFIED TOLERANCES ARE ANGLES SUFFACE FLATINESS AR PL ± .5 ± .015 per foot 5- max. Chine surfages are a single surfage. PART #. HTS96	SUPERIOR 4225 HWY 90 E BROUSSARP, LA. 750: PH: 337-837-8847 FAX: 337-837-8839 YLINDER ASSEMBLY 59 MATERIAL SPECIFICATION
UNLESS OTHERWISE SP 2 PLACE DEC 3 PLACE DEC FRACTIONS ± 0.00 ± 0.05 ± 1/16 1. Dimensions are in inches 2. Remove burns & shaip edges with 1/64x4 3. Machined fillet radii are 1/32 4. Normality Squareness & port Jelleism of machined fillet radii are 1/32 5. Machined fillet radii are 1/32 6. Machine diameters on a common centering within .005 T.J.R & unmachined diameters	APPROX.WEIGHT (lbs.) = PECIFIED TOLERANCES ARE ANGLES SURFACE FLATNESS AR PL. ± .5 20 + 0.015 per foot FART NAME: PLISH C	SUPERIOR 4225 HWY 90 E BROUSSARP, LA, 750: PH: 337-837-8847 FAX: 337-837-8839 YLINDER ASSEMBLY 59 MATERIAL SPECIFICATION G Matt.Req: Initial Condition:



SECTION 12 9 5/8" HYTOPSTM CONTROL PANEL ILLUSTRATIONS

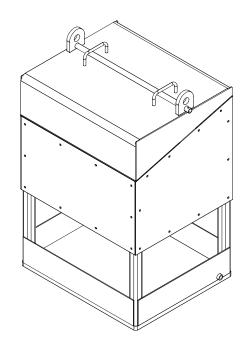
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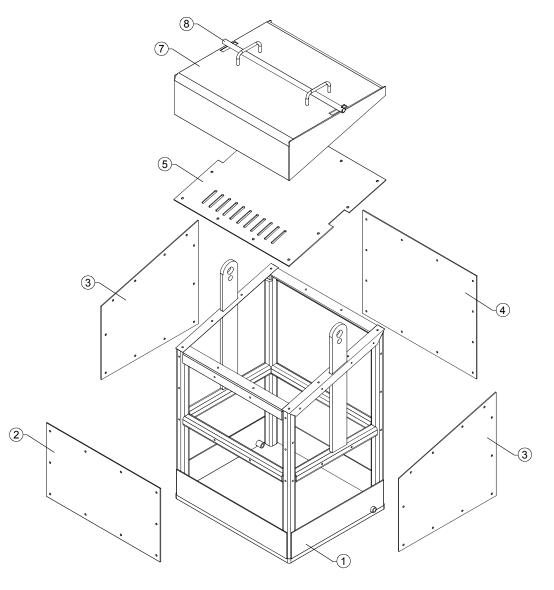
CONTROL COLSOLE ASSEMBLY (P/N: PU2000)	12 - 3
CONTROL CONSOLE DIMENSIONS (P/N: PU2002)	12 - 4
CONTROL CONSOLE COVER DIMENSIONS (P/N: PU2011)	12 - 5
CONTROL CONSOLE ASSEMBLY (P/N: PU2300 1 of 2)	12 - 7
CONTROL CONSOLE DIMENSIONS (P/N: 2300 2 of 2)	12 - 8

Revision: 12/02

SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System Revision: 12/02	Page 12 - 2
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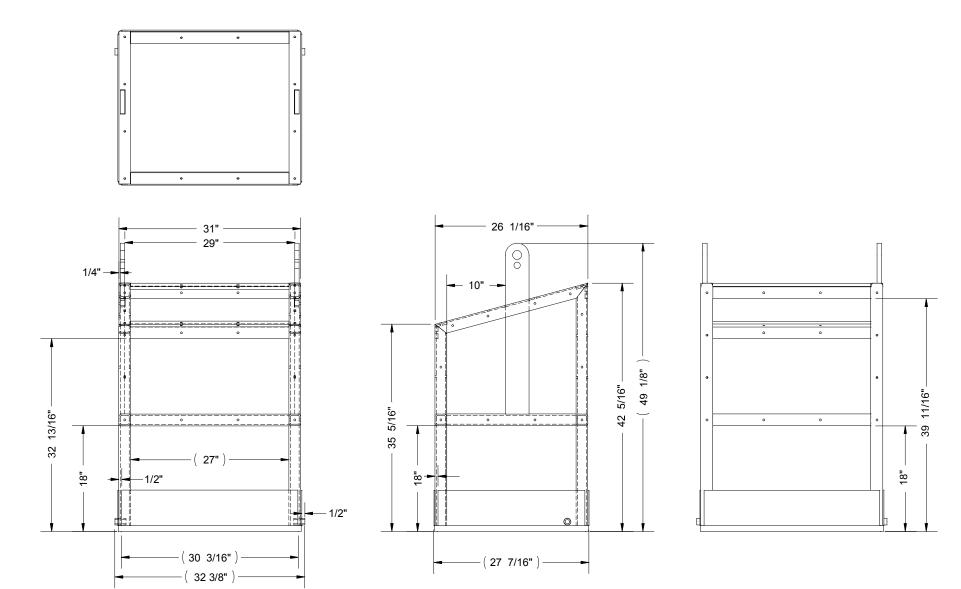
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1	1	PU2002	
2	1	PU2003	
3	2	PU2004	
4	1	PU2005	
5	1	PU2006	
6	2	1609-A	1/2" NPT FLUSH PLUG
7	1	PU2011	
8	1	PU2012	
9	56		5/16-18 x 1" HHCS STAINLESS
10	56		5/16" LOCKWASHER STAINLESS
11	2		1/4"-20 NYLOCK STAINLESS
12	2		1/4"-20 x 2 HHCS STAINLESS



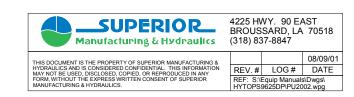


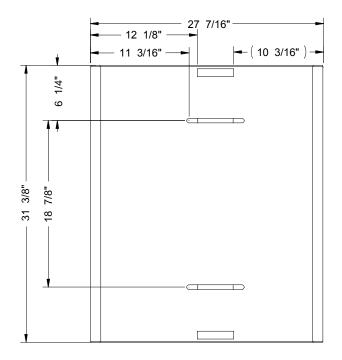
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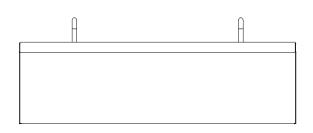


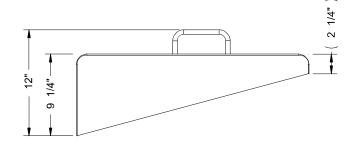


CONTROL CONSOLE DIMENSIONS





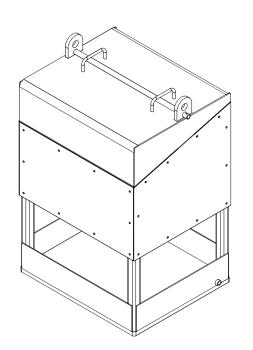


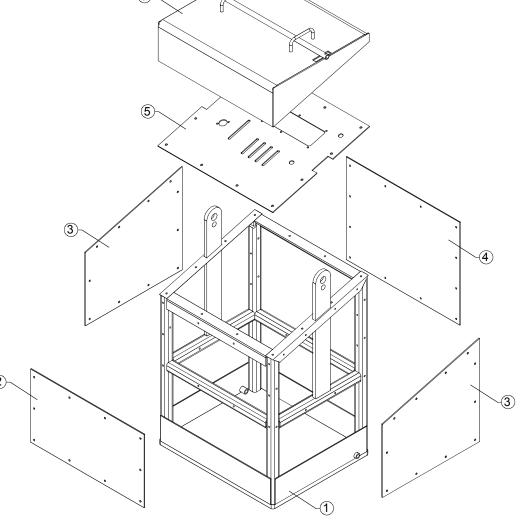


CONTROL CONSOLE COVER DIMENSIONS

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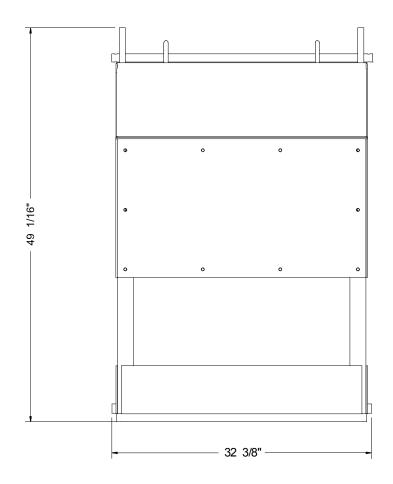
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2	1	PU2003	
3	2	PU2004	
4	1	PU2005	
5	1	PU2301	
6	1	PU2011	
7	1	PU2012	
8	56		5/16-18 x 1" HHCS STAINLESS
9	56		5/16" LOCKWASHER STAINLESS
10	2		1/4"-20 NYLOCK STAINLESS
11	2		1/4"-20 x 2 HHCS STAINLESS
12	2	1609-A	1/2" NPT FLUSH PLUG

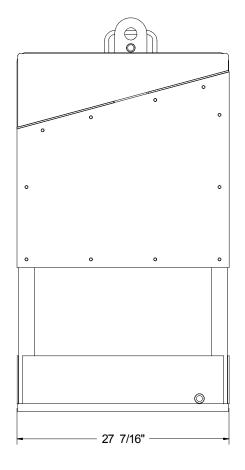




CONTROL CONSOLE ASSEMBLY







CONTROL CONSOLE ASSEMBLY



SECTION 13 CONTROL SYSTEM

Description and Operation

The control and instrumentation system provides a means to remotely operate all tong and backup functions associated the **CLINCHER®** 9 5/8" Drillpipe Tong and 9 5/8" **LOCKJAW**TM Backup for drillpipe. Descriptions of the system, subsystems, major components, and operating information follows:

The hydraulic control system used with the Tong Positioner, **CLINCHER®** 9 5/8" Drillpipe Tong and 9 5/8" **LOCKJAW**TM Backup for drillpipe are designed exclusively for use with closed, pressure compensated power units. These units must be capable of producing 2500 psi output pressure with flow rates up to 45 to 50 gallons per minute. **WARNING:** Attempting to operate this unit with a power unit designed for open center valves will result in the power unit operating continuously at maximum pressure, will cause overheating, and may cause equipment failures possibly exposing personnel to high pressure, high temperature hydraulic fluid leaks. This control system utilizes direct acting controls. Refer to hydraulic schematic (Ref. Fig. 6) while reviewing the following information.

System connections for controls, power unit supply and return circuits are located at the rear of the suspension system. Bulkheads also serve as manifolds to distribute and collect fluid throughout the system. These manifold connections are indicated on the schematic by the BOLD LETTERS **P** and **R** surrounded by a box indicating a connection to the pressure or return manifold respectively. Instruments and control circuits are transferred from the main structure to the control console by means of a series of hydraulic hoses.

Detailed Component Descriptions

System pressure is fed to a pressure reducing valve (Items 6) located within the tong control console. This valve drops system pressure to 1500 for selected tong functions. This reduced pressure is fed into an aluminum block manifold (Item 8) within the tong control console and five small Bosch brand directional control valves mounted on the face of the tong control console (Ref. Figs. 4 & 6, Items 2A through 2C, 3A and 3B). These valves directly operate the tong functions including the tong operation mode (Ref. Figs. 4 & 6, Item 2A), makeup/breakout reversing pin control cylinders (Ref. Figs. 4 & 6, Items 3A and 3B) and the tong gear shift cylinder (Ref. Figs. 4 & 6, Item 2B) and tong door cylinder (Ref. Figs. 4 & 6, Item 2C).

The tong directional control valve (Ref. Figs. 4 & 6, Item 16A) controls flow of fluid to the tong motor (Item 25). A remotely operated pressure relief valve (Ref. Figs. 4 & 6, Item 5) on the makeup side of the motor can be set using the panel mounted Torque Limiter (Item 5) to manually regulate makeup torque. Note breakout torque is not regulated. An electrically operated solenoid dump valve module (Item 23A) is integrated into Item 23 for automatic control by a torque turn data acquisition system. A second pressure relief valve (Item 23) is located on the breakout side of the motor. This valve is used in combination with the first F:\Data\DWG\Client\Kwick Konect\manual docs2.wpd - page 4 of 5 - July 6, 2001 (11:05am) remotely operated pressure relief valve, a pair of opposed check valves (Items 24) with 145 psi cracking pressure, a shuttle valve (Item 22) and the door position sensor (Item 17) to prevent tong ring gear rotation whenever the tong door is opened. The shuttle valve is used to insure the door

SECTION 13 CONTROL SYSTEM

position sensor function operates in both directions by diverting pressure from the active pressure relief valve to the door position sensor. The pressure drop generated by the check valve insures all fluid is diverted through the open relief valve. The remotely operated pressure relief valves (Items 23) are also used to stop cage plate and ring gear rotation when they are being rotated in "reverse" to return to the open throat position after completing a joint makeup cycle. This control system uses the tong operation valve (Ref. Figs. 4 & 6, Item 2A) to sense the direction of rotation; *i.e.*, make-up or break-out. When a cam mounted on the top cage plate opens the cage plate sensor valve (Item 17), the remotely operated pressure relief valve on the "reverse" side of the motor is opened dumping pressure to the return circuit stopping all rotation. Note when rotating in "reverse", it is important to rotate slowly not to overshoot the open throat position.

The tong operation valve (Ref. Figs. 4 & 6, Item 2A) provides a pilot signal to a hydraulically operated 2-position 3-way control valve (Item 30). When the tong operation valve is in the makeup position and the tong is being rotated in the "forward" makeup direction, the action of the cam opening the cage plate sensor valve dumps the valve on the "reverse" side of the motor so there is not observable effect. The cam on the cage plate also operates two other position sensor valves (Item 17). These valves in combination with check valves (Items 21), prevent the reversing pin cylinders from extending except when the cage plate is stopped and the sensor valves are held in the open position. The cylinders are held in the retracted position by spring load reversing pin cylinder control valves (Item 3). When in the normal position these valves direct the 1500 psi pressure to the retract side of the cylinders.

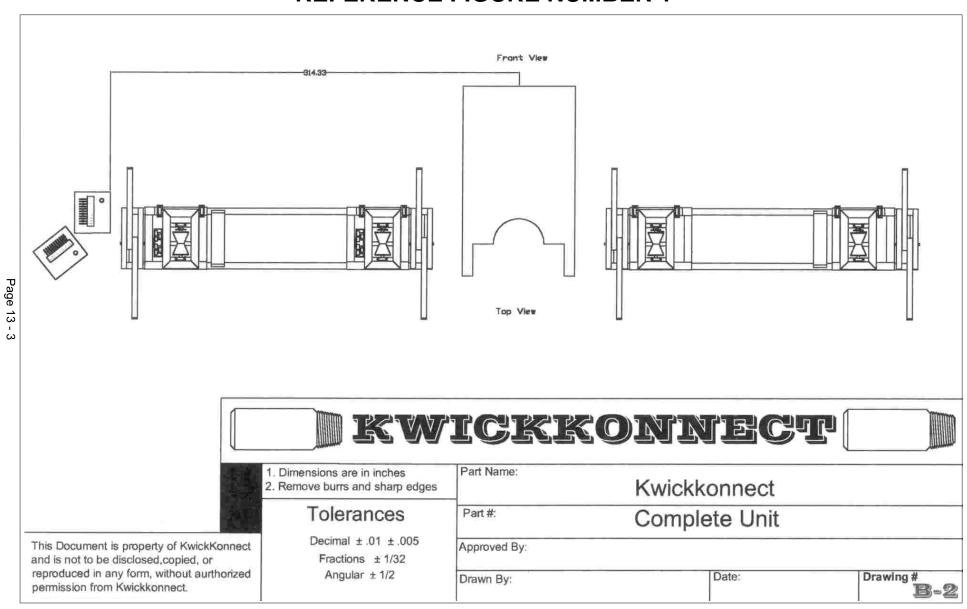
The tong door is opened by a 2-position 2-way detented directional control valve (Ref. Figs. 4 & 6, Item 2C) which directs 1500 psi pressure to the tong door cylinder (Item 18). Door operation speed is limited by fixed orifices (Items 32) located internally in fittings attached to the cylinder ports. The tong gear shifter cylinder (Item 27) is controlled by a 2-position 2-way detented directional control valve (Ref. Figs. 4 & 6, Item 2B). This cylinder applies a load to a double acting spring incorporated within the shifter linkage. This system allows the cylinder to fully stroke even when gears do not immediately mesh. This spring then fully shifts the gear when tooth rotation permits meshing.

The **LOCKJAW**TM Backup is directly operated by means of a panel mounted spring loaded 3-position 4-way directional control valve (Ref. Figs. 4 & 6, Item 16B). The pressure used to close the backup is limited by means of a pressure reducing valve (Item 35). When the backup is fully closed, a door position sensor cam valve (Item 34) allows full system pressure to be applied to the clamping cylinder. Pressure is directed through a pilot operated check valve (Item 29) and a flow control valve (Item 13) which is used to regulate cylinder speed. The pilot operated check valve traps pressure in the cylinder so it is not necessary for the operator to continuously apply clamping pressure to the backup. Opening the backup requires the directional control valves to be shifted to the open position. Retraction pressure acting on the pilot operated check allows fluid to be exhausted from the extend/clamp side of the cylinder.

Tong output torque is measured using a compression load cell (Item 14) which generates hydraulic pressure proportional to torque. This pressure is measured as torque using a specially calibrated torque gage (Item 11). A valve is incorporated with torque gage circuitry to allow spikes and surges to be dampened if required. A check valve allows the load cell circuit to be refilled in the event fluid is lost as a result of a leak or ruptured load cell diaphram.

SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System

Revision: 09/01 Page 13 - 2



Dump Valve Pilot	Air On (p1)	Air Off (p3)	Air In (p2)	Load Sense	Load Sense	Positioner Transverse In	Positioner Rotation Horizontal	Positioner Elevation Up	Backup Open	Tong Motor Makeup
Tong Motor Speed High (p1)	Tong Door Open (B)	Tong Gear Shift High (B)	Reversing Pin Control	Reversing Pin Control	Tong Operation	Out	Vertical	Down	Closed	Breakout
High (p1)		nigit (B)	Breakout (B)	Makeup (B)	Make (A)					
Low (p3)	Closed (A)	Low (A)	Normal (A)	Normal (A)	Break (B)					
Press	sure	Pre	ssure	Ta	nk	Tani	K		Tank	

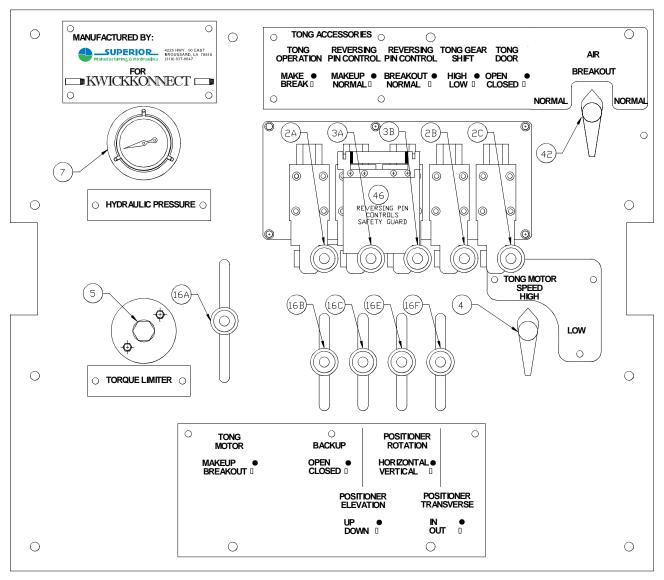
TONG & POSITIONER CONTROL CONSOLE REAR BULKHEAD LAYOUT

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Front Pipe Feed	Right Safety Stops	Left Safety Stops	Right Hourglass Rollers	Left Hourglass Rollers	Right "Y" Rollers	Left "Y" Rollers	Right Elevation Rollers	Left Elevation Rollers
Hold	Down	Down	Right	Right	Down	Down	Down	Down
Release	Up _	Up	Left	Left	U p	Up 	Up _	Up
Pipe Hold	e Feed Release	oad Sense		Tank		Pressure	Pipe I Hold	Release Feed

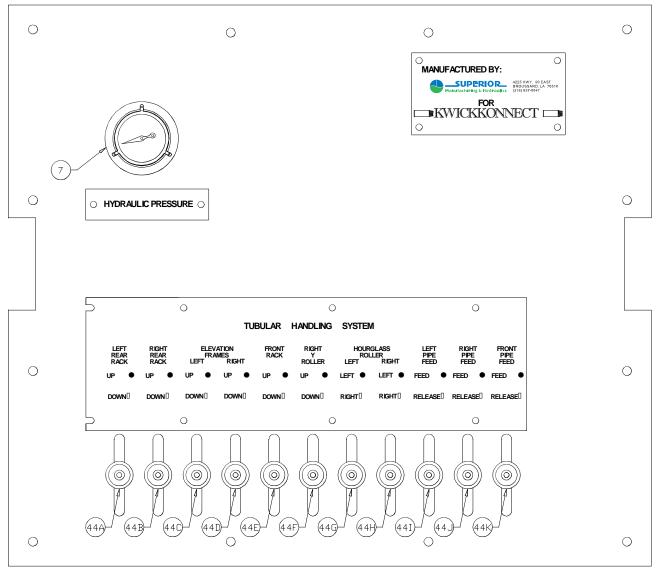
PIPE RACK CONTROL CONSOLE REAR BULKHEAD LAYOUT

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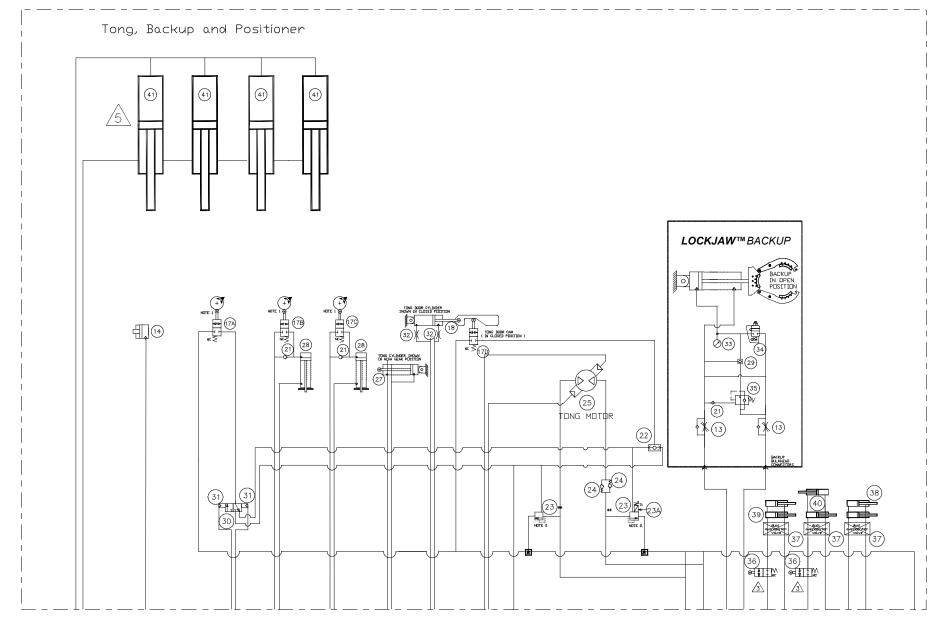
TONG CONTROL PANEL ILLUSTRATION

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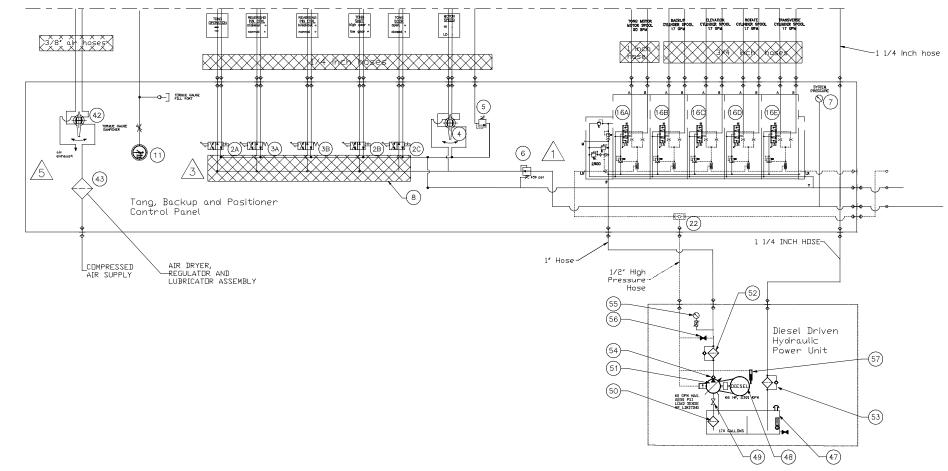


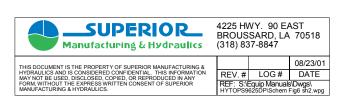
PIPE RACK CONTROL PANEL ILLUSTRATION

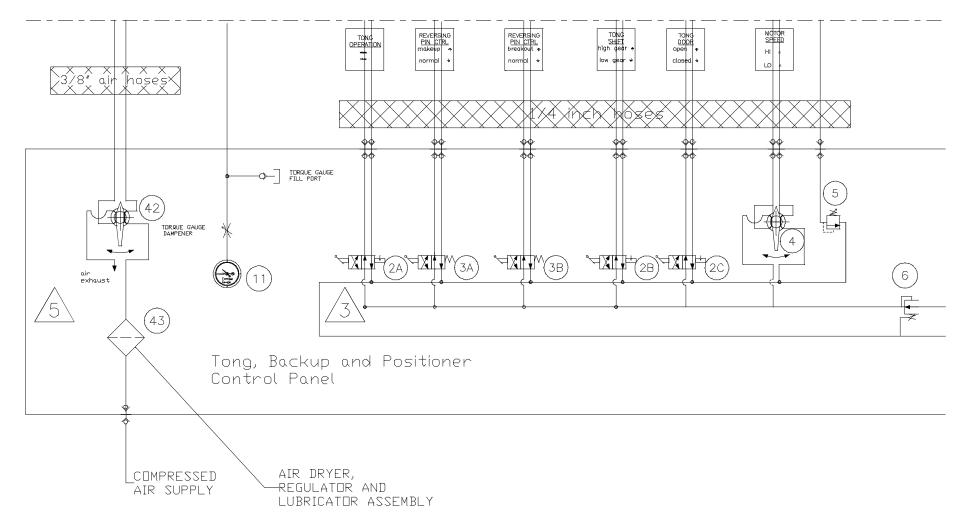
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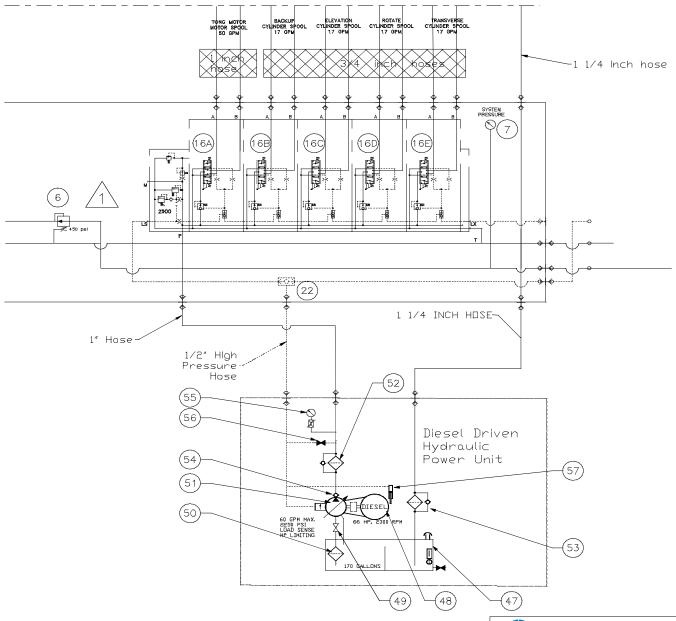




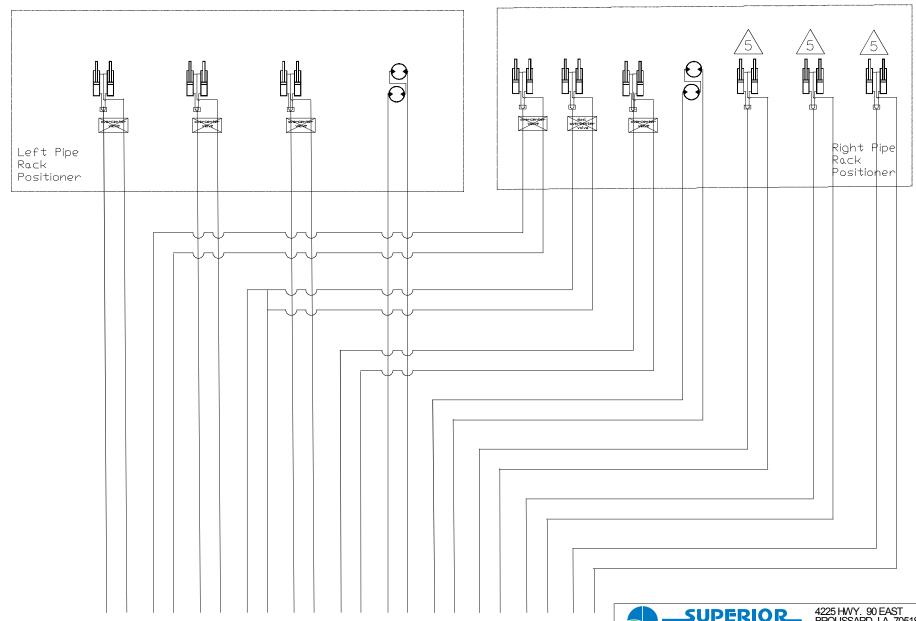










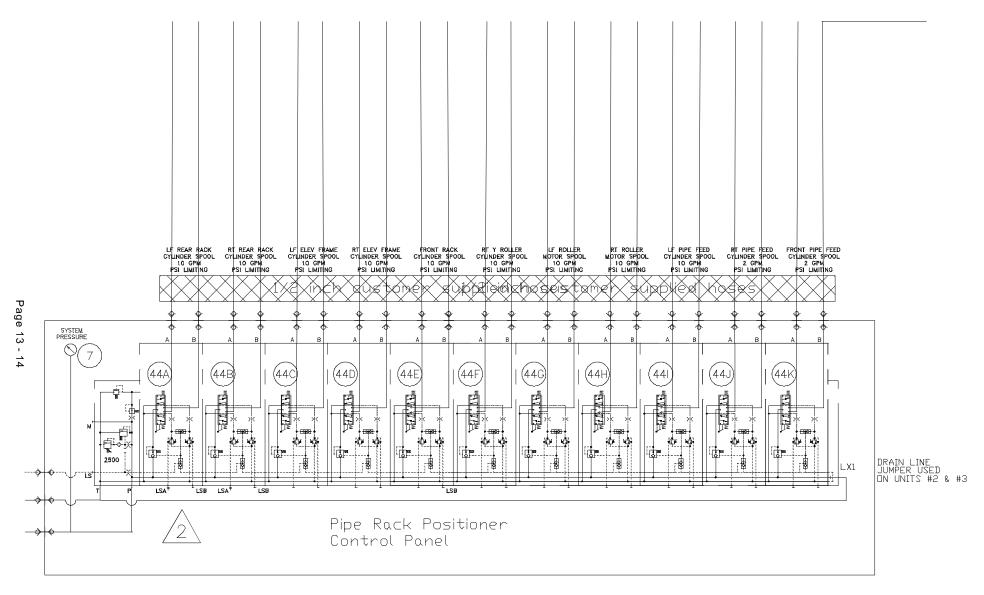


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9 5/8" Drillpipe TONG/BACKUP SYSTEM HYDRAULIC SCHEMATIC COMPONENTS

ITEM	PART NO.	DESCRIPTION	QTY.
1			
2	CRSS20006	BOSCH- 2 posDetent / 4-way- DO3 Valve, Lever operated, 4600 PSI Max, 23 GPM-Max PN:(0810091388)	3
3	CRSS20007	BOSCH- 2 posSpring Ret./ 4-way- DO3 Valve, Lever operated, 4600	2
		PSI Max, 23 GPM-Max P/N:(0810091389) WHITEY-4-WAY BALL VALVE-SS-43YF2 (HI/LO VALVE)	
4	73028	DYNEX- Remotely operated Relief Valve ,panel mount	1
5	CRSS20009	PN:(8820-01-1/4-21)	1
6	CM7654	Sun pressure reducing valve YPDA-KAN-BB	1
7	BAC-5M25RCFF	0-3000 PSI Gauge (STAINLESS FACE)	1
8	CRSS15005	Damon 5 bank manifold A-DOBP-05-02S/C	1
9	CRSS15050	Manifold Mounting Plate	1
10	SM-120-44C	47" Handle x 125,000 ft.lbs. Torque Gauge w/ Dampener & Fill Port	1
12	3IVI-120-44C	47 Handle X 123,000 H.ibs. Forque Gauge W Dampener & Fill Fort	'
13	1800	Parker Flow Control F600	2
14	SM-120-44C	47" Handle x 125,000 ft.lbs. Loadcell	1
15		2,222	
16	155H9597	Danfoss PGV120/32 combo 5 bank Directional Control Valve assembly	1
17	SLV1000-01	NC Self Lubricated Valve	4
18	82080	Tong Door Cylinder	1
19			
20			_
21	CM4554	Check Valve 3/8 NPT	2
22	CRSS20021	Shuttle Valve 1/4 NPT	2
23 23a	2070 55058-S	DUMP VALVE-DENISON 1 1/4" P/N:(R4V10-5A9-10A1) DENISON VVO1 SOLENOID actuator for dump valve	2
23a 24	58099	HIGH PRESSURE CHECK VALVE-PN:(CVH145-1000N)	2
		RINEER- 2 Speed Motor GA015-65-021-3 w/ SM&H shaft 82040, high	
25	82099	pressure shaft seal and shaft seal retainer	1
26			
27	2047	Tong Shift Hi/Lo Cylinder	1
28	13606	Make/Break Mode Cylinders	2
30	BUC5524 VS4BUBF7-HD	Pilot Operated Check Valve SUN# CKEB LBN BCC/S 15 PSI CROSS Pilot Operated Diversion Valve	1
		High Pressure Pilot Caps w/ o-ring & 4 SHCS for Cross Diversion Valve	
31	2085	VS4BUBF7	2
32		Fixed Orifice	2
33	1650	0-3000 psi Gauge P/N:(BAC-3M-25)	3
34	SLV1000-02	N.O. Self Lubricated Valve	1
35	CM7654	Sun pressure reducing valve YPDA-KAN-BB	1
36	MA50-ACNC	3/4" cam operated valve	2
37	1EEP12T-30-S SWC4-2500-40B	Danfoss 3/4" dual over center valve assembly Traverse Cylinders	3
39	SWC4-2500-40B	Elevation Cylinders	2
40	HTS9616	Rotation Cylinders	2
41	HTS9659	Air Cylinders	4
42	SS-45YF8	Whitey 1/2" 2 position, 3 way ball valve for air cylinder control	1
43	D18-03-FLGO	Wilkerson air filter/dryer/regulator/lubricator assembly	1
44	AD03P0502S	Danfoss PGV32 11 bank directional control valve assembly	1
45	PO2016	Torque Gauge mounting post	1
46		Reversing Pin directional control valve safety guard assembly	1
47	PU2010	Superior Mfg & Hyd 170 hydraulic reservoir w/ filler port, site gages	1
48	F4L912	Duetz 4 cylinder air cooled diesel engine c/w pump adapter & coupling	1
49 50	BLV-200000S3312 SS-2.5-100-3	DMIC Suction Isolation Valve Schroeder suction strainer	1
51	PVWH45RDFSHFNNTKCP	Oilgear pressure compensated pump w/ HP limiter and load sense	1
52	KF30-2K10-S-D5	Schroeder pressure filter	1
53	RT-2K10-P-Y2	Schroeder return filter cartridge assembly	1
54	ICFT-A-6132N15	Inserta pump discharge check valve	1
55	CF12-210A	Panel mount pressure gage	1
56	FFG-2002T	Load sense isolation valve	1
57	BJTC	Hydraulic throttle control cylinder assembly	1

SUPERIOR Manufacturing & Hydraulics, Inc.	
9 5/8" Hydraulic Tong Positioner System Revision: 09/01	Page 13 - 16

SECTION 14 CLINCHER® LOADCELL and TORQUE GAUGE

The **CLINCHER®** Tong and Backup are available in versions which accommodate compression load cells or tension style load cells. All information contained in this Technical Manual refers to products which utilize compression load cells. Contact SUPERIOR for information concerning products using tension load cells.

Part Number	SM120-44-C
Torque Rating	120,000 ft lbs
Handle Length	44.63 inches
Loadcell Type	Compression
Loadcell Manufacturer	SUPERIOR MANUFACTURING & HYDRAULICS
Assembly Documentation	Calibration Certificate

CLINCHER® Load cells and Torque Gauges are produced by several manufacturers. The information provided by MD TOTCO or Acadiana Oilfield Instruments may not be applicable to all torque gauges or load cells. This reference information is provided with the permission of MD TOTCO and Acadiana Oilfield Instruments.

Page 14 - 1

SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System Revision: 07/01	Page 14 - 2

SECTION 14 CLINCHER® LOADCELL and TORQUE GAUGE

To request copy of Load Cell Technical Information, please contact:

Superior Manufacturing & Hydraulics 4225 Hwy. 90 East

Broussard, LA 70518

Phone: 337-837-8847

Fax: 337-837-8839

www.superior-manf.com

SUPERIOR Manufacturing & Hydraulics, Inc. 9 5/8" Hydraulic Tong Positioner System	
Revision: 07/01	Page 14 - 4

SECTION 15 MOTOR SERVICE MANUALS

To request copy of Rineer Motor Service Manuals, please contact:

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Revision: 0701 Page 15 - 1

SECTION 16 PARTS LIST

Diesel Driven Hydraulic Power Unit

2,300 RPM, 66 HP, 60 GPM, 2,500 PSI Power Unit

Description	Manufacturer	Model Number
Reservoir - 170 Gal.	S M & H	PU2010
Diesel Engine c/w Pump, Adapter, & Coupling	Duetz	F4L912
Suction Isolation Valve	DMIC	BLV-20000S3312
Suction Strainer	Schroeder	SS-2.5-100-3
Hydraulic Pump	Oil Gear GDC1/Rev	PVWH45RDFSHFNNTKCP
Pressure Filter	Schroeder	KF30-2K10-S-D5
Return Filter Cartridge Assembly	Schroeder	RT-2K10-P-Y2
Pump Check Valve	Inserta	ICFT-A-6132N15
Pressure Gauge	DDI	CF12-210A
Load Sensor ISO Valve	REGO	FFG-2002T

Note: Standard industrial hydraulic system components including hydraulic hoses, pipe fittings, and low pressure suction isolation valve components are not specifically identified.

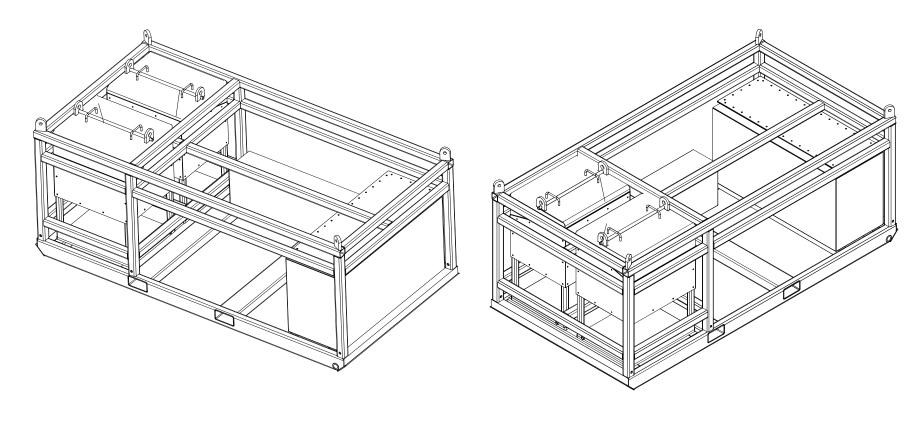
Revision: 07/01 Page 16 - 1

DUETZ 4 CYLINDER, AIR COOLED DIESEL ENGINE

F4L912/HYD. SPEC. 66HP CONT. @ 2300 RPM

OILBATH AIR CLEANER
V-BELT GUARD
8/10 FLYWHEEL
SAE# 3 FLYWHEEL HOUSING
HYDRAULIC PUMP DRIVE
CAST IRON MANIFOLD
SPARK ARRESTOR & RAIN CAP
FLEX MOUNTS
MANUAL AIR INTAKE SHUTDOWN
MECHANICAL V-BELT SHUTDOWN
SENTINEL LOW OIL PRESSURE / HIGH OIL TEMP SHUTDOWN
AM3 AIR STARTER
AUTO OVERSPEED SHUTDOWN

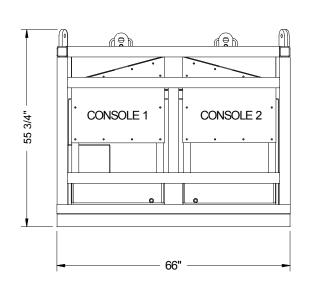
Revision: 07/01 Page 16 - 2

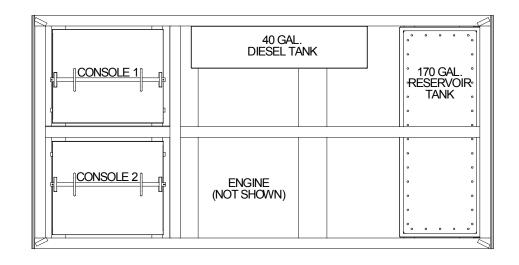


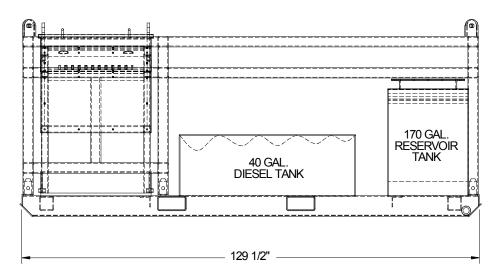
NOTE: ENGINE AND BASKET GRATING NOT SHOWN FOR CLARITY PURPOSES.

HYDRAULIC POWER UNIT ILLUSTRATION



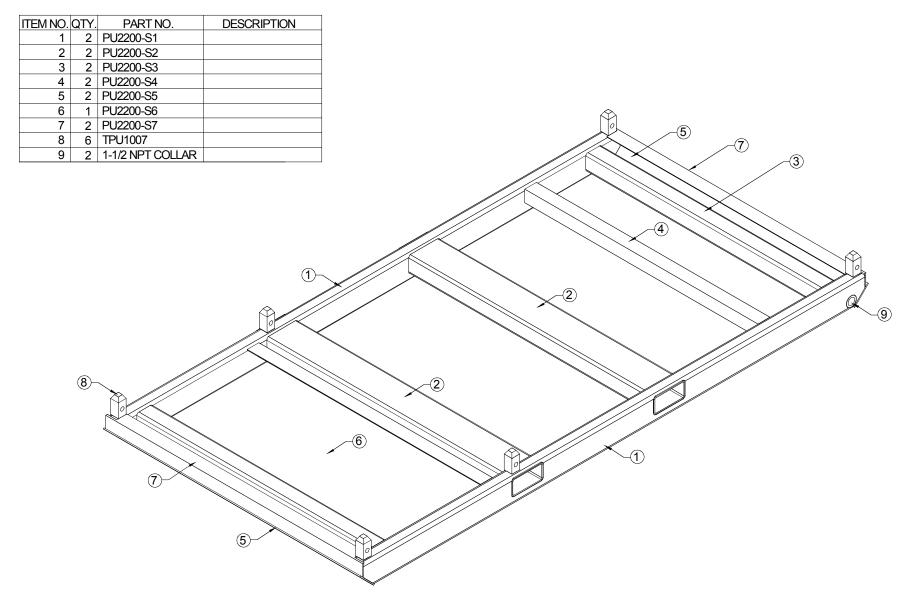






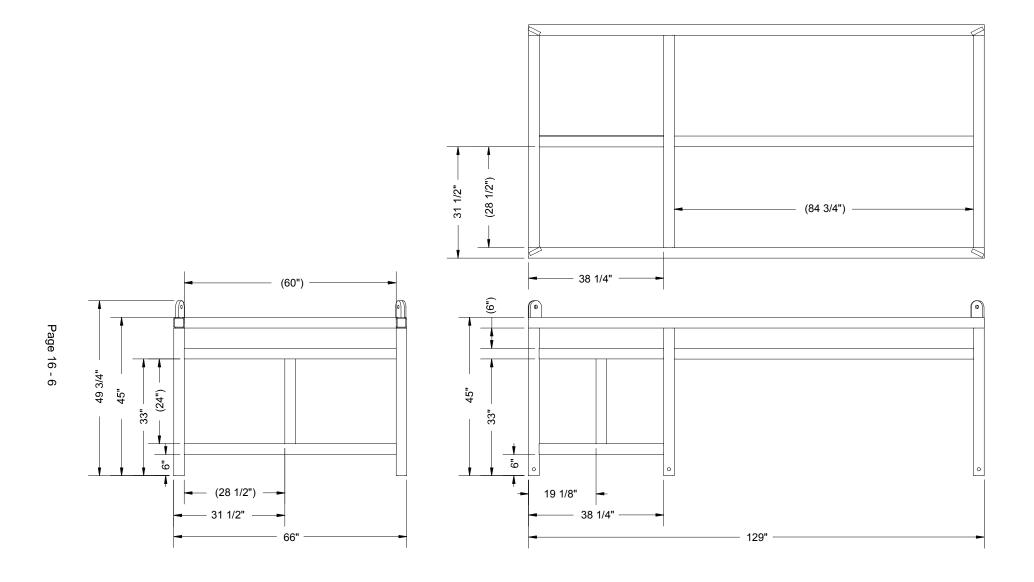
HYDRAULIC POWER UNIT ILLUSTRATION

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HYDRAULIC POWER UNIT BASE WELDMENT

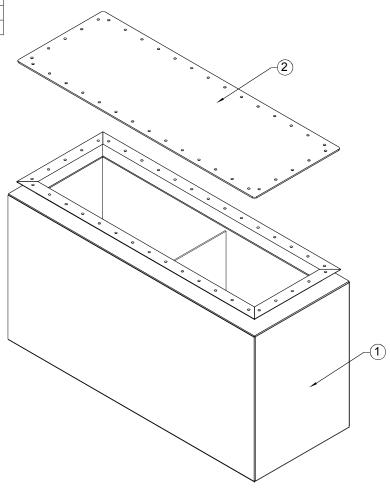




HYDRAULIC POWER UNIT BASKET WELDMENT

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ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	PU2007	
2	1	PU2008	
3	38	1027	3/8" LOCKWASHER
4	38	1024	3/8"-16 NC NUTS
5	38	1047	3/8"-16 x 1" HHCS



HYDRAULIC POWER UNIT RESERVOIR TANK ASSEMBLY



To request copy of Power Unit Technical Data, please contact:

Superior Manufacturing & Hydraulics 4225 Hwy. 90 East

Broussard, LA 70518

Phone: 337-837-8847

Fax: 337-837-8839

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Revision: 07/01

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Revision: 07/01	Page 16 - 10

SECTION 17 HYDRAULIC COMPONENTS TECHNICAL DATA

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KCV151011. U7/U1	1 450 11 - 2